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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

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SHRIMP EXPLORATION IN CENTRAL ALASKAN WATERS

BY M/V JOHN N. COBB, JULY- AUGUST 1958

By Melvin R. Greenwood*

SUMMARY

The growth of Alaskan shrimping, which began in 1916, was apparently handicapped by the high cost of hand picking of shrimp and by high transportation rates. The introduction in 1956 of peeling machines on the West Coast for processing the small cocktail-size shrimp and the subsequent successful use of those machines, has renewed interest in the possibilities of expanding the existing Alaskan fishery.

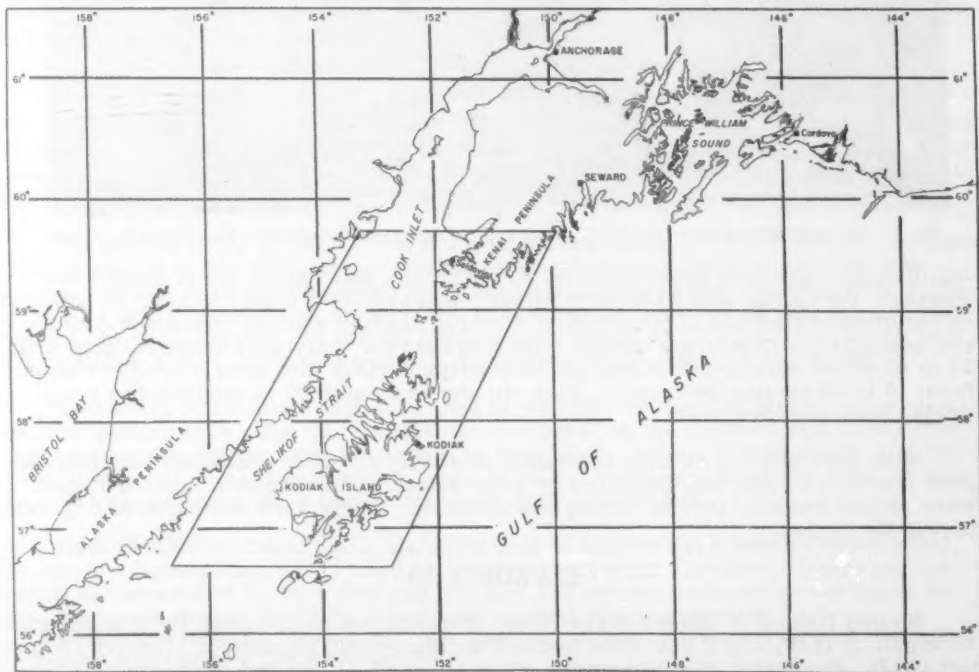


Fig. 1 - Central Alaska. Outline shows areas explored by the John N. Cobb, during shrimp explorations in July and August 1958.

Considerable information regarding the latent shrimp resources of Alaska has been obtained in recent years through explorations conducted by the U. S. Bureau of Commercial Fisheries. To assess the shrimp populations of Lower Cook Inlet and

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Kodiak Island, the Bureau's exploratory fishing vessel, John N. Cobb did exploratory fishing between July 22 and August 26, 1958. During the cruise a total of 109 drags was made using Gulf of Mexico-type shrimp trawls.

Excellent shrimp catches in Kachemak and Marmot Bays consisted of up to 1,770 and 1,400 pounds of heads-on shrimp per half-hour tow, respectively. Trawl-



Fig. 2 - Cod end of shrimp trawl on John N. Cobb with catch of shrimp from Nuka Passage, Kenai Peninsula, Alaska.

ing in numerous other areas--Alitak, Kukak, Nuka, and Uganik Bays, Inner Nuka Passage, Port Dick, and Raspberry Strait--also produced good catches. In contrast to exploratory findings in other areas, Central Alaskan catches contained substantial quantities of sidestripe shrimp with averages for individual drags ranging from 23 to 69 whole shrimp per pound and coonstripe shrimp with drag averages ranging from 16 to 84 shrimp per pound. Pink shrimp averaging 56 to the pound in some drags, were also common.

Most good shrimp catches contained relatively few fish. Although considerable poor trawling bottom was indicated by echo-sounding, the grounds actually fished were almost entirely free of bottom obstructions. Snags were encountered only twice during the cruise.

BACKGROUND

Shrimp fishing in Alaska began in the southeastern region near Petersburg and Wrangell in 1916, and it has since become an important "off-season" fishery (Wigutoff 1953). Expansion of shrimping to other areas of Alaska has been attempted; however, those occasional ventures have been sporadic and on a small scale (Bower 1917-48; and Thompson 1950-56). Apparently the growth of the fishery has been handicapped by the high cost of hand-picking small pink shrimp and high transportation rates. The successful use of mechanical peeling machines, introduced to the West Coast in 1956, has served to renew interest in the expansion of the Alaskan shrimp fishery.

In recent years the Bureau of Commercial Fisheries has acquired considerable information concerning the latent shrimp resources in various waters of Alaska. From 1950 through 1957, nine shrimp explorations were conducted; 5 off Southeastern Alaska, 1 in Yakutat Bay, 2 in Prince William Sound, and 1 extending from near the Shumagin Islands to the Unalaska Island area.^{1/} These explorations revealed numerous areas having commercial potential. The most successful cruise was made in 1957 when catches ranged up to 3,800 pounds in a half-hour drag in the Shumagin Island area. Although results of earlier explorations were not as outstanding, catches might have been larger if fishing had been conducted with a Gulf-type trawl rather than with a small beam trawl.

In some Central Alaskan waters, commercial fishermen periodically have reported large catches of shrimp. Indications of a potential shrimp resource in Olga Bay, Kodiak Island, were noted during king-crab explorations conducted by the U. S. Fish and Wildlife Service in 1940 (U. S. Fish and Wildlife Service 1942). Pink shrimp were also taken in a midwater trawl between Cape Douglas and Shuyak Island in 1957 (Aron 1958). The Lower Cook Inlet and Kodiak Island areas, however, had not been systematically explored for shrimp prior to 1958.

Between July 22 and August 26, 1958, the shrimp resources in Central Alaskan waters were assessed by the Bureau's North Pacific Fisheries Exploration and Gear Research Station. Fishing was carried out with the exploratory fishing vessel John N. Cobb in waters of Lower Cook Inlet, along the Kenai Peninsula, and adjacent to Kodiak Island (fig. 1). Objectives of the cruise were to: (1) locate and determine species, size, and abundance of shrimp, (2) determine the bottom conditions on prospective shrimp grounds, and (3) collect oceanographic data which could be helpful in understanding shrimp distribution as related to the environment.

GEAR USED

All but two drags during the cruise were made with a $1\frac{1}{2}$ -inch mesh,^{2/} standard 43-foot,^{3/} Gulf of Mexico-type, flat shrimp trawl similar to that described by Schaefers and Johnson (1957). The net was attached directly to the back of the doors with two-foot extensions of the headrope and footrope.

The ground chain of the 43-foot net was equal in length to the footrope. Its ends were shackled at the junction points of the breastlines and footrope, and 14-link dropper chains were hung between the footrope and ground chain at intervals of 24 inches. During the last few drags of the cruise the net was fished with the dropper chains removed, leaving the ground chain attached only at its ends. The trawl was towed with a single cable attached to a 25-fathom bridle ahead of the doors.

Two drags were made with a $1\frac{1}{2}$ -inch mesh, 70-foot, Gulf of Mexico-type, semi-balloon shrimp trawl (fig. 3).^{4/} This net was towed in the conventional otter-trawling manner with warps from the vessel to each door. Seven-foot headrope and footrope extensions, plus 5-foot chains fastened to the trailing edge of the door, resulted in a total distance of 12 feet between the door and the net.

Both nets were fished using standard Gulf of Mexico-type doors (Bullis 1951), which are lighter than doors used by Pacific coast otter trawlers. Doors for the small net measured $2\frac{1}{2}$ by 5 feet and weighed 160 pounds each, while the doors for the large nets measured $3\frac{1}{2}$ by 8 feet and weighed 385 pounds each.

^{1/}For results of those surveys see: Schaefers 1951, 1953; Ellson and Livingstone 1952; Schaefers and Smith 1954; Schaefers et al 1955; Greenwood 1958; and Johnson 1959.

^{2/}All mesh sizes referred to in this report are stretched measure including 1 knot.

^{3/}Net sizes given in this report represent the length of the footrope, excluding the extension straps.

^{4/}Note that the net in figure 3 is drawn in conformance with the net-illustrating method proposed by W. Dickson at the International Fishing Gear Congress, Hamburg, Germany, 1957; i. e., all lengths are true to scale (stretched measure), while all widths are reduced 50 percent.

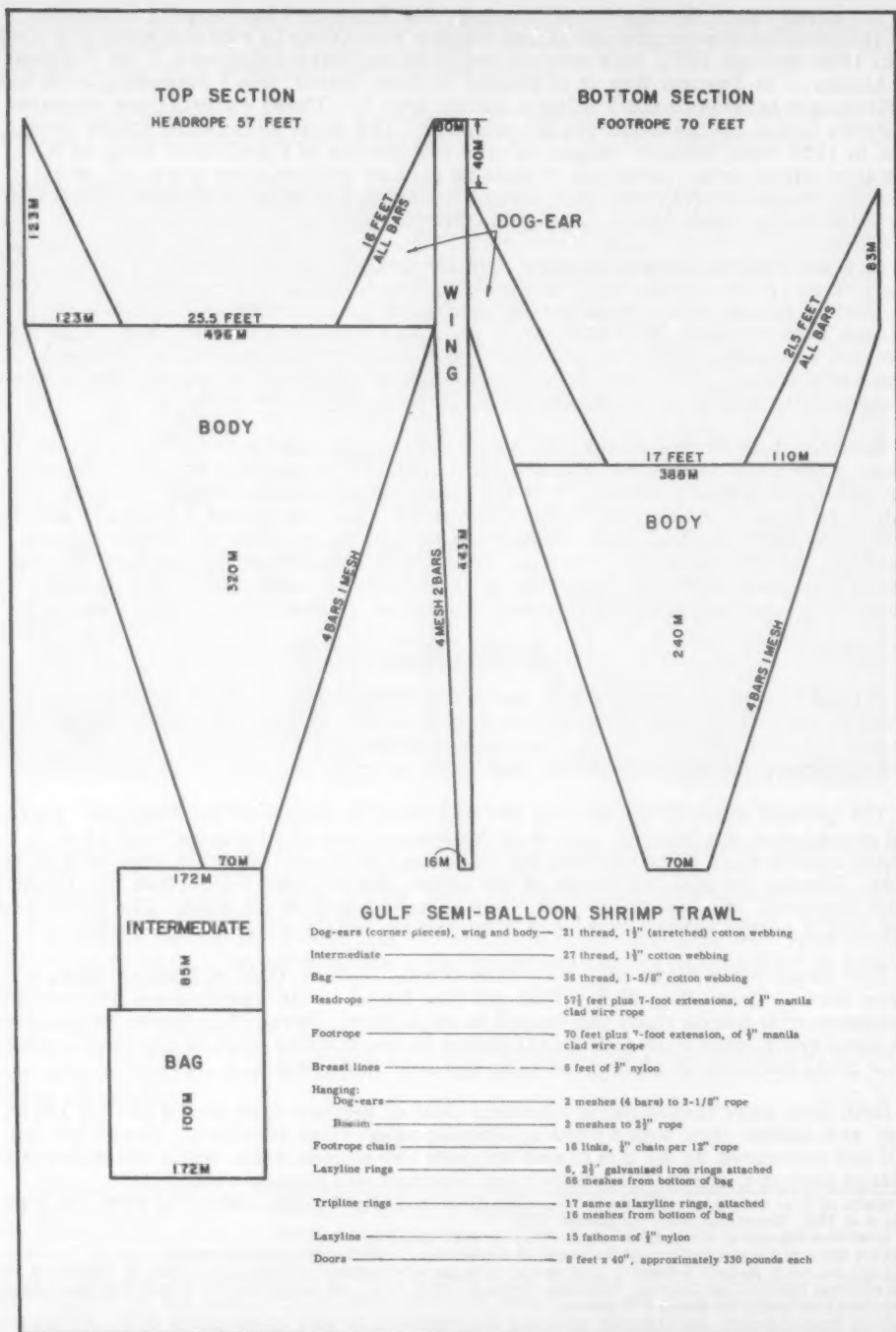


Fig. 3 - Seventy-foot Gulf of Mexico-type semiballoon shrimp trawl used during shrimp explorations in Central Alaska.

A warp-length to water-depth ratio (scope) of approximately 3 to 1 was used, and the nets were towed at speeds between 2.5 and 3.0 knots. Drags were of 30-minute duration, except for five 15-minute drags off Port Dick, where the lack of available grounds precluded longer tows.

FISHING RESULTS

Three species of shrimp were taken in commercial quantities during the cruise. Small cocktail-size pink shrimp (*Pandalus borealis*) were taken throughout the area of operation. A larger species--sidestripe shrimp (*Pandalopsis dispar*) were also found to be widely distributed. Coon-stripe shrimp (*Pandalus hypsinotus*), representatives of another larger species, were caught mostly in the Kenai Peninsula area. Other species which were taken in small quantities included: dock shrimp (*Pandalus danae*), spot shrimp (*Pandalus platyceros*), humpy shrimp (*Pandalus goniurus*), *Eulus suckleyi*, *Eulus macilentus*, and several species of gray shrimp belonging to the family Crangonidae.



Fig. 4 - Catch of shrimp on sorting table aboard M/V John N. Cobb in Kachemak Bay, Alaska. Note: Sorting table holds 1,000 pounds of shrimp, level-full.

Excellent shrimp catches were made in Kachemak Bay and Marmot Bay near the towns of Homer, Seldovia, and Kodiak. Catches as large as 1,770 pounds of shrimp were taken in Kachemak Bay, and catches up to 1,400 pounds were taken in Marmot Bay. The average catch, for drags made in those two bays, was 655 and 603 pounds, respectively.

Trawling in many smaller bays and inlets, within about 5 to 11 hours running time of Homer, Seldovia and Kodiak, also produced good catches. Drags in Alitak Kukk, Nuka, and Uganik Bays, Inner Nuka Passage, Port Dick, Raspberry Strait, and off Cape Douglas yielded shrimp at rates ranging from 265 to 950 pounds per half hour.

In contrast to the results of Bureau explorations conducted off Washington and Oregon, many shrimp catches taken off Alaska contained substantial quantities of

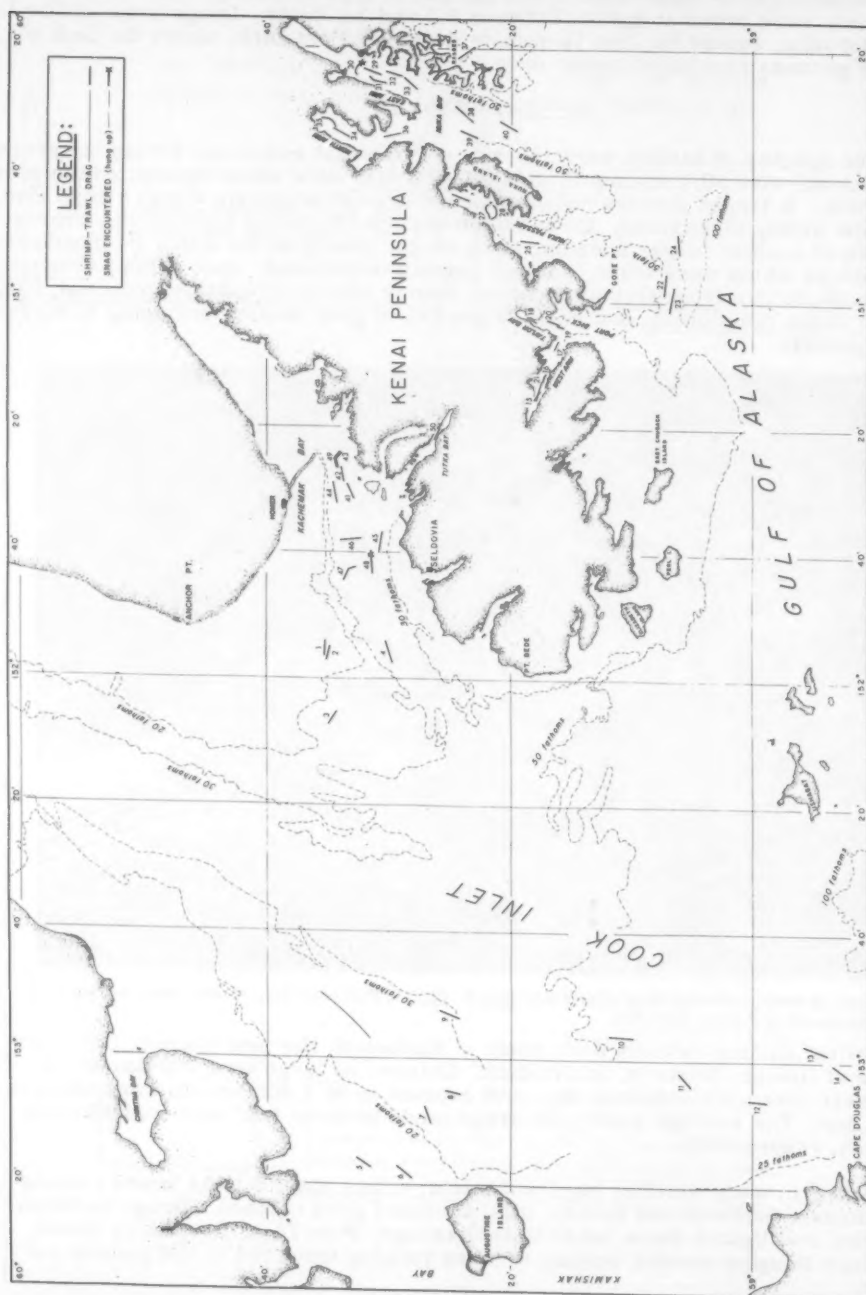


Fig. 5 - The Lower Cook Inlet and Kenai Peninsula areas of Central Alaska showing location of shrimp-trawl drags made by the John N. Cobb during July and August 1958.



Fig. 6 - The Kodiak Island and Shelikof Strait areas of Central Alaska showing location of shrimp-trawl drags made by the John N. Cobb during August of 1958.

sidestripe and coonstripe shrimp. In several bays along the Kenai Peninsula those species were predominant in the catches.

Although the slopes of many of the bays were found to be relatively steep, clear trawling bottom prevailed in most areas fished. Snags were encountered only twice during the cruise, and in both instances net damage was slight. The bottom was composed of mud or a mixture of mud and sand in areas yielding good catches of shrimp.

The location of each of the 109 exploratory drags made during the investigation is diagrammatically presented in figures 5 and 6.

FISHING RESULTS IN LOWER COOK INLET AND KENAI PENINSULA AREAS:
The best catches in the Lower Cook Inlet and Kenai Peninsula areas were made in

Kachemak Bay, off Cape Douglas, in Port Dick, in Nuka Passage, and off Ragged Island. Most drags made in Cook Inlet and in offshore waters south of Kenai Peninsula yielded little or no shrimp.

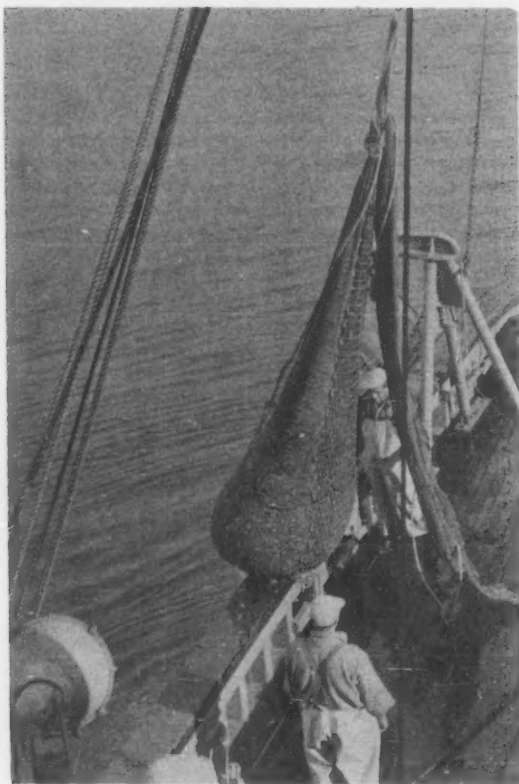


Fig. 7 - Hoisting cod end full of shrimp over rail of John N. Cobb in Kachemak Bay, Alaska.

Kachemak Bay: The most productive catches in Kachemak Bay were taken from a deep area off Homer Spit and the northern slope of the gully which runs along the southern shoreline between Homer Spit and Seldovia Bay. Five drags made in depths ranging from 53 to 92 fathoms in and near the deep, which is located about 5 miles southwest of the end of Homer Spit, resulted in catches of 360 to 1,020 pounds of shrimp. From 36 to 79 percent of those catches consisted of 26- to 48-count^{5/} sidestripes. On the north slope of the gully near Seldovia Bay, two drags made at depths between 39 and 50 fathoms caught 740 and 1,770 pounds of shrimp, mostly 200-count pinks. One drag made in Tutka Bay, in 41 to 52 fathoms, resulted in 810 pounds of mixed pink and coonstripe shrimp. The coonstripe shrimp, which made up about 39 percent of this catch, averaged 28 shrimp per pound heads on.

drags made between Kachemak Bay and Kamishak Bay at depths between 15 and 86 fathoms caught about 70 pounds of shrimp. Most of the inlet south of Anchor Point is shallow (less than 40 fathoms), and a large part of the bottom is irregular and probably not suitable for trawling.

Cook Inlet: Catches in Lower Cook Inlet were poor. Twelve

^{5/}All shrimp counts given in this report indicate the average number of heads-on individuals per pound, and were obtained from random samples. Selected shrimp, i.e., those caught with larger mesh nets, or graded shrimp, would be expected to count out much larger than do the random samples. Catch rates are expressed as pounds of heads-on shrimp.

Cape Douglas: Two drags, made 7 to 11 miles off Cape Douglas in 88 to 91 fathoms, resulted in 540 and 600 pounds of mixed pink and sidestripe shrimp. Sidestripes accounted for 15 and 33 percent of those catches, respectively.

Port Dick: The limited area suitable for trawling, and the relatively steep side slopes in Port Dick made it necessary to shorten the trawling time of most drags to 15 minutes. The upper end of West Arm afforded the best trawling bottom despite a large kelp bed which was encountered about 3 miles from the end of the bay. Three drags made in this area at depths between 58 and 101 fathoms yielded 240 and 360 pounds of shrimp in the 15-minute drags and 870 pounds in the half-hour drag. Four drags were made on the steep side slopes of Port Dick. One of those drags, starting in 139 fathoms and ending in 36 fathoms, yielded 540 pounds in 30 minutes. The average catch rate for all drags made in Port Dick was 510 pounds of shrimp per half hour drag.

Catches in Port Dick were composed of mixed pink, sidestripe, and coonstripe shrimp. Although pink shrimp dominated the catches, a considerable quantity of sidestripe and coonstripe shrimp were taken. Pinks ranged in size from 75 to 120 count; sidestripes, from 37 to 69 count; and coonstripes, from 30 to 84 count.

OFFSHORE WATERS SOUTH OF KENAI PENINSULA: Only trace amounts of shrimp were taken in three drags made in offshore waters 6 to 8 miles south of Gore Point. Extensive soundings, within about 10 miles of the peninsula, revealed no other likely offshore shrimp-trawling grounds between Nuka Bay and the eastern entrance to Cook Inlet.

Nuka Passage: Three drags made in the inner part of Nuka Passage, at depths ranging from 49 to 84 fathoms, produced from 390 to 780 pounds of shrimp each. The catches were composed of about half pink shrimp and half mixed sidestripes and coonstripes. The pinks averaged 71 to 96 shrimp to the pound, while the sidestripes ran 44 to 69 per pound. The coonstripes in those catches averaged 23 to 27 shrimp per pound.

Nuka Bay Area: Fishing results in Nuka Bay indicated the presence of a large shrimp population which was widely distributed throughout the bay. The best catches were made in East Arm at depths between 47 to 124 fathoms. Five drags made in this area yielded from 240 to 330 pounds of shrimp each. Those catches consisted of 32 to 62 percent pinks, 33 to 62 percent sidestripes, and 1 to 9 percent coonstripes. The size of pink shrimp taken in that area ranged from 86 to 109 shrimp per pound, while sidestripes ranged from 41 to 58 to the pound. A snag was encountered in East Arm where the net was fished too close to the submarine moraine of McCarty Glacier.

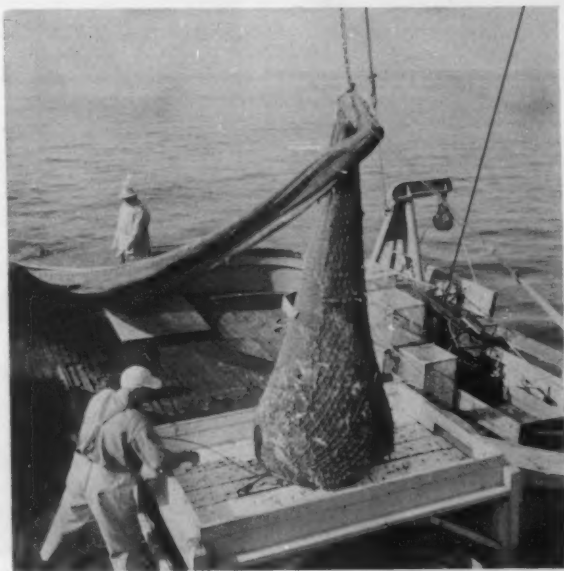


Fig. 8 - Ready to spill catch of shrimp onto sorting table aboard M/V John N. Cobb in Kodiak Island area.

In other portions of Nuka Bay, at depths between 69 and 158 fathoms, six drags resulted in 150 to 280 pounds of shrimp. Those catches consisted of 54 to 71 percent pinks ranging from 67 to 73 shrimp per pound, 25 to 45 percent sidestripes ranging from 27 to 40 shrimp per pound, and up to 12 percent coonstripes which ran 16 to 21 shrimp per pound (heads on).

A single drag made southwest of Ragged Island yielded a catch of relatively large shrimp. In a total catch of 450 pounds, 39 percent of the catch comprised 86-count pinks, 55 percent was composed of 23-count sidestripes, and 6 percent was 18-count coonstripes.

FISHING RESULTS IN THE KODIAK ISLAND AND SHELIKOF STRAIT AREA: Explorations during the last half of the Central Alaskan cruise were conducted principally in Marmot Bay and Shelikof Strait. Excellent catches of shrimp were made in Marmot Bay, but catches in Shelikof Strait were generally poor. Some of the small bays and inlets along Kodiak Island and Shelikof Strait yielded good catches.

Marmot Bay Area: Although the bottom in Marmot Bay was generally clear, irregular bottom, suitable for short drags only, was found in the gully on the north side of Spruce Island. Fifteen drags in Marmot Bay yielded an average of 603 pounds of shrimp each.



Fig. 9 - A catch consisting predominantly of fish, taken from Shelikof Strait during exploratory fishing.

In Inner Marmot Bay six drags at depths from 58 to 109 fathoms resulted in 350 to approximately 1,400 pounds of shrimp per drag.^{6/} Those catches were composed of 56 to 83 percent pinks ranging in size from 104 to 127 shrimp per pound. Sidestripe shrimp, which comprised the balance of those catches, ranged from 34 to 51 shrimp to the pound.

Three drags made off Izhut Bay in 93 to 111 fathoms caught 730, 850, and 1,300 pounds of shrimp each. Those catches were composed of 73, 69, and 92 percent pinks with average counts of 135 to 172 per pound. The balance of the catch was sidestripe shrimp averaging from 41 to 51 individuals to the pound.

In Outer Marmot Bay six drags were made at depths between 69 and 110 fathoms. Except for drag No. 103, which produced approximately 700 pounds of pink shrimp averaging 94 shrimp to the pound, catches ranged from 120 to 300 pounds per drag. Those catches were composed of 54 to 89 percent pinks which ran 59 to 77 shrimp per pound. The remaining portions of the catches were 24- to 42-count sidestripes.

Shelikof Strait: Pink and sidestripe shrimp were found distributed throughout Shelikof Strait, but in concentrations considerably less than found in adjacent bays. ^{6/}The size of the largest catch had to be estimated and counts were unobtainable as the whole catch was lost when the cod end parted from the intermediate as the catch was being lifted over the stern rail.

The best catches were made on the bank between Shuyak Island and Cape Douglas in depths of 82 to 88 fathoms. Two drags in this area yielded 200 and 300 pounds of shrimp containing 72 and 90 percent pinks averaging 96 and 70 shrimp per pound, respectively. Sidestripe shrimp, which made up the balance of those catches, ran 45 and 53 shrimp to the pound. A drag off Raspberry Island in 106 to 107 fathoms resulted in 250 pounds of which 63 percent was 44-count sidestripes and 37 percent was 81-count (heads-on) pinks.

The remaining 33 drags made in Shelikof Strait at depths ranging between 68 and 154 fathoms yielded up to 180 pounds of shrimp per drag.

Miscellaneous Bays and Inshore Waters: Although fishing results were generally good in each of the five smaller bodies of water fished in the Kodiak area, insufficient time was available to determine the full extent of trawlable grounds or the distribution of shrimp. Priority was given to exploring offshore waters during the final phase of the cruise; consequently only eight drags were made in those protected waters.

The single drag made in Kukak Bay in 57 to 63 fathoms caught 950 pounds of shrimp; about half pinks and half sidestripes. The pinks averaged 117 shrimp to the pound, while the sidestripes averaged 32 shrimp per pound.

Table 1 - Miscellaneous Fish--Percentage in Drags Catching 150 or More Pounds of Shrimp per Half Hour

		Number of drags (those catching 150 pounds or more shrimp per half hour)	Pounds of heads-on shrimp per half-hour drag		Miscellaneous fish (percentage of total catch weight)		Predominant species of miscellaneous fish
			Range	Avg.	Range	Avg.	
COOK INLET AND KENAI PENINSULA AREA	Nuka Passage	3	390 - 775	612	3 - 15	8	Alaska pollock
	Kachemak Bay	8	150 - 1,770	708	2 - 22	8	halibut, herring, sculpin
	Tutka Bay	1		810		9	flathead and yellowfin "sole"
	Port Dick 1/2	7	180 - 870	513	7 - 27	14	Alaska pollock
	Nuka Bay	11	150 - 330	248	8 - 37	16	turbot ^{3/}
	off Cape Douglas	2	540 - 600	570	26 - 28	27	Alaska pollock, turbot
	off Ragged Island	1		450		39	turbot
	Cook Inlet	0		---		---	---
	off Gore Point	0		---		---	---
KODIAK ISLAND AND SHELKOF STRAIT AREA	Alitak Bay	2	500 - 900	700	2 - 4	4	sculpin
	Kukak Bay	1		950		13	turbot
	off Iskut Bay	3	730 - 1,300	960	13 - 24	16	turbot
	inner Marmot Bay ^{2/}	5	350 - 1,100	610	4 - 32	19	turbot
	Uganik Bay	2	200 - 1,000	600	25 - 49	30	Alaska pollock, yellowfin "sole"
	outer Marmot Bay	5	150 - 700	319	28 - 63	44	flathead "sole", turbot
	Shelikof Strait	6	160 - 300	207	29 - 73	55	Pacific ocean perch, flathead "sole", Alaska pollock, turbot
	Raspberry Strait	1		650		59	sablefish, flathead "sole", turbot
	Uyak Bay	2		200	70 - 83	78	flathead "sole", Alaska pollock, turbot

^{1/}Includes five 15-minute drags. Catch analysis adjusted to half-hour rate.

^{2/}Does not include Drag No. 98 as catch breakdown was not obtained.

^{3/}Arrow-toothed flounder.

One drag made in Uganik Bay (South Arm) in 35 to 41 fathoms caught 1,000 pounds of shrimp. That catch was 87 percent pink and dock shrimp and 13 percent coonstripes. Counts for those species were 117, 129, and 81 heads-on individuals to the pound, respectively. The other drag in Uganik Bay was made in 88 to 94 fathoms and caught 200 pounds of shrimp.

Two drags made in Uyak Bay each caught 200 pounds of shrimp of which more than half was sidestripes.

Two drags in Alitak Bay caught 500 and 900 pounds of shrimp consisting of approximately 80 percent pink and dock shrimp and 20 percent sidestripes and coonstripes. Pinks ranged from 108 to 133 shrimp per pound; dock shrimp averaged 115; sidestripes averaged 40; and coonstripes averaged 65 shrimp per pound.

The single drag made in Raspberry Strait caught 650 pounds of 115-count pink shrimp.

MISCELLANEOUS FISH CATCH: In catches containing 150 pounds of shrimp or more, the weight of incidentally-caught fish varied between 2 and 83 percent of the total catch (table 1). Areas producing the least amount of miscellaneous fish included: Alitak Bay, Kachemak Bay, Nuka Passage, and Tutka Bay. Areas producing a considerable amount of miscellaneous fish included: Outer Marmot Bay, Raspberry Strait, Shelikof Strait, and Uyak Bay. The latter areas generally yielded mediocre or poor catches of shrimp.

The most commonly caught miscellaneous fish were Alaska pollock (*Theragra chalcogramma*) and turbot (arrow-toothed flounder, *Atheresthes stomias*). Flat-head "sole" (*Hippoglossoides elassodon*) were caught in considerable numbers in several areas. Other food fish noted in the catches included: halibut (*Hippoglossus stenolepis*), herring (*Clupea pallasii*), Pacific ocean perch (*Sebastes alutus*), sablefish, *Anoplopoma fimbria*, and the yellowfin "sole" (*Limanda aspera*).

King crab (*Paralithodes camtschatica*) were caught in small numbers. Only 35 of the 109 drags caught king crab and only 7 of those caught more than 5 crabs.

MISCELLANEOUS OBSERVATIONS

Weather and oceanographic observations were recorded at each fish position.^{7/} Air temperatures averaged about 51° F., surface water temperatures averaged about 49° F., and bottom water temperatures averaged about 42.5° F. during the explorations in Central Alaska (table 2).

Table 2 - Summary of Temperature Observations Made During Shrimp Explorations in Central Alaska

	Cook Inlet - Kenai Peninsula Area		Kodiak Island - Shelikof Strait Area	
	Range	Avg.	Range	Avg.
	F.	F.	F.	F.
Air temperatures	49 -56	51.7	48 -56	51.1
Surface temperatures	46 -53.5	49.6	45 -51	49.0
Bottom temperatures	41 -47	43.4	38 -44.5	41.9
Difference between surface and bottom temperatures	1.0-12.5	6.2	2.0-11.5	7.2

Although rain occurred on approximately half the days spent in Central Alaska, and fog was occasionally encountered, at no time were fishing operations curtailed because of weather conditions. When wind and sea conditions made fishing in open waters undesirable explorations were carried out in sheltered areas.

APPENDIX

A detailed fishing log showing the fishing positions, time on bottom, catch particulars, and other pertinent data for each drag is available as an appendix to the

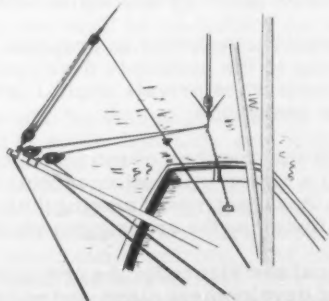
^{7/}Supplemental oceanographic information is available at the Seattle office of the Branch of Exploratory Fishing and Gear Research.

reprint of this article. Write for Separate 553, which contains Table 3 - Fishing Log--Shrimp Trawl Drags Made in Lower Cook Inlet and Kodiak Island Area--July 22 to August 26, 1958--U. S. Fish and Wildlife Service Exploratory Fishing Vessel John N. Cobb.

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Note: The shrimp explorations in Central Alaskan Waters were planned and carried out in cooperation with the Alaska Region, Bureau of Commercial Fisheries, and the Alaska Department of Fisheries. Members of the fishing industry were also consulted for views and ideas concerning the project. Representatives from all three groups accompanied the John N. Cobb at various times during fishing activities.



STERN RIG FOR TOWING THE TRAWL

CURRENT STATUS OF THE INTER-AMERICAN DEVELOPMENT BANK

By Raymond E. Steele*

When the proposed Inter-American Development Bank is approved by the members of the Organization of American States through their regular legislative processes, it will be simpler and easier for United States businessmen to invest in Latin American industries. Since many United States fisheries interests have invested or are contemplating investing or working with Latin American countries in developing the fisheries of those countries, it would be to their advantage to study the purpose, responsibilities and functions of the Inter-American Development Bank, and how it can aid them in financing Latin American fisheries activities. . . . Editor.

The Inter-American Economic and Social Council on April 8 this year met in Washington and toasted the results of its fruitful work. The Specialized Committee of the Council termed it "Final Act." It set in motion the proposed "Inter-American Development Bank."

In the remarks of the Chairman of the Council at the April 8 meeting is this expression: "In thus completing its appointed task, this Committee has set forth the instrument of organization of what will doubtless become the most important inter-American institution dedicated to the promotion of economic development in our countries."

The Chairman meant "our countries" as being Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, United States, Uruguay, and Venezuela. The "instrument" is the charter of the Bank itself. Membership shall be comprised of the above countries. "The purpose of the Bank shall be to contribute to the acceleration of the process of economic development of the member countries, individually and collectively." (Article I).

The functions of the Bank as set forth in Section 2, Article I, are as follows:

"Section 2. Functions

(a) To implement its purpose, the Bank shall have the following functions:

- (i) to promote the investment of public and private capital for development purposes;
- (ii) to utilize its own capital, funds raised by it in financial markets, and other available resources, for financing the development of the member countries, giving priority to those loans and guarantees that will contribute most effectively to their economic growth;
- (iii) to encourage private investment in projects, enterprises, and activities contributing to the economic development and to supplement private investment when private capital is not available on reasonable terms and conditions;
- (iv) to cooperate with the member countries to orient their development policies toward a better utilization of their resources, in a manner consistent with the objectives of making their economies more complementary and of fostering the orderly growth of their foreign trade; and
- (v) to provide technical assistance for the preparation, financing, and implementation of development plans and projects, including the study of priorities and the formulation of specific project proposals.

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(b) In carrying out its functions, the Bank shall cooperate as far as possible with national and international institutions and with private sources supplying investment capital."

The authorized capital, referred to as the Fund is one billion dollars. Of this sum \$850,000,000 shall be divided into 85,000 shares having a par value of \$10,000 each, which is divided up as follows according to total subscriptions: Argentina - 10,134; Bolivia - 828; Brazil - 10,314; Chile - 3,832; Colombia - 2,830; Costa Rica - 414; Cuba - 3,684; Dominican Republic - 552; Ecuador - 552; El Salvador - 414; Guatemala - 552; Haiti - 414; Honduras - 414; Mexico - 6,630; Nicaragua - 414; Panama - 414; Paraguay - 414; Peru - 1,382; United States - 35,000; Uruguay - 1,106; Venezuela - 5,526.

Further legislative action on the part of the above countries is necessary before the Bank can get in business. Article XV states: "This Agreement (Charter) shall be deposited with the General Secretariat of the Organization of American States, where it shall remain open until December 31, 1959, for signature by the representatives of the Countries listed in Annex A (the 21 countries). Each signatory country shall deposit with the General Secretariat of the Organization of American States an instrument setting forth that it has accepted or ratified this Agreement in accordance with its own laws and has taken the steps necessary to enable it to fulfill all of its obligations under this Agreement."

This means that the legislatures of the respective countries have until the last of this year to appropriate the necessary funds for the Bank and formally adopt the charter. Due to the popularity of the Bank proposal in the Latin American countries there is little likelihood that any of them will refuse to act before the December 31 deadline. In the case of the United States, the proposal is reputed to be quite popular with the Congress and the Administration as well. It is the type of foreign aid program that seems to have great appeal in this country. Though the United States is to supply most of the funds for the Bank, it places a responsibility on each member country that is not inherent in our present grant-in-aid program.

There is, of course, great speculation as to when the Bank actually will be in business. The best guess is not before the end of the year. Besides the legislative action which must be taken by the member countries, the Bank will have to be set up under the "Organization and Management" provisions contained in Article VIII before it can function. Section one of this article states: "The Bank shall have a Board of Governors, a Board of Executive Directors; a President, an Executive Vice President, a Vice President in charge of the Fund, and such other officers and staff as may be considered necessary."

One of the provisions of the charter that will have great appeal to American investors is contained in Article XI, Section 4, "Immunity of Assets. Property and assets of the Bank, wheresoever located and by whomsoever held, shall be considered public international property and shall be immune from search, requisition, confiscation, expropriation, or any other form of taking or foreclosure by executive or legislative action."

The location of the Bank will be Washington, D. C. Arrangements are going on behind the scenes to house it at some desirable spot within the city. It will be some time yet before the public is advised of the *modus operandi* the Bank will employ before receiving applications for loans. Meanwhile the stage is being set for various projects to get under way once the Bank is in business. An economic conference gets under way in Buenos Aires on April 27 which is designed to further study the development needs of Latin American countries. The chairman of the Inter-American Economic and Social Council had this to say: "We are certain that the Inter-American Development Bank will fulfill a truly important function in a moment of special significance to the economic evolution of the Hemisphere and we are also confident that the scope and effect of this action will surpass our most optimistic expectations."

△△△△△△△△



RESEARCH

IN SERVICE LABORATORIES

PROXIMATE COMPOSITION OF GULF OF MEXICO INDUSTRIAL FISH

Part 3 - Fall Studies (1958)

By Mary H. Thompson*

ABSTRACT

The protein, oil, ash, and moisture content of limited samples of 17 species of industrial fish commonly taken during the fall in the Gulf of Mexico area are reported. Included also are length and weight data for those same species. The method of sampling is evaluated.

INTRODUCTION

Studies started in the winter of 1958 on the proximate composition of Gulf of Mexico industrial fish have been continued to include the fall months. The project was undertaken to provide more complete information for use by industrial fisheries on the protein, oil, ash, and moisture content of 17 representative species of industrial fish found in the area. Length and weight data have also been obtained.



Fig. 1 - Shrimp is a valuable byproduct of industrial fishing.

Observations made during the fall months (September, October, and November) point to the necessity for tabulating the data seasonally, as moisture and oil content varies markedly in some species with meteorological conditions. The data should be gathered over a long period of time in order to show the true trends and variations. Since, however, there is an immediate need by industry for this information, an effort has been made to disseminate it as recorded.

SAMPLES

All samples for the fall series have been collected by laboratory personnel from boats landing in the Pascagoula area. These samples had been welliced for 2 to 3 days previous to collection and were in good to excellent condition upon arrival at the laboratory. They were immediately frozen in plastic bags and stored at -20° F. until analyzed.

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PHYSICAL MEASUREMENTS

The frozen fish were thawed, rinsed, and drained before physical measurements were made. The length measurements were of two types. Those species having a well-defined fork tail were measured from the extreme tip of the mouth to the apex of the angle formed by the two sides of the tail. These are referred to in table 3 as "forktail" measurements. Those species having a more or less blunt tail were measured from the extreme end of the mouth to the farthest extension of the tail. These are referred to in table 3 as "overall" measurements. All length measurements are recorded in centimeters.

Weight measurements have been recorded in grams and were obtained by means of a double-beam balance. These figures are also given in table 3.

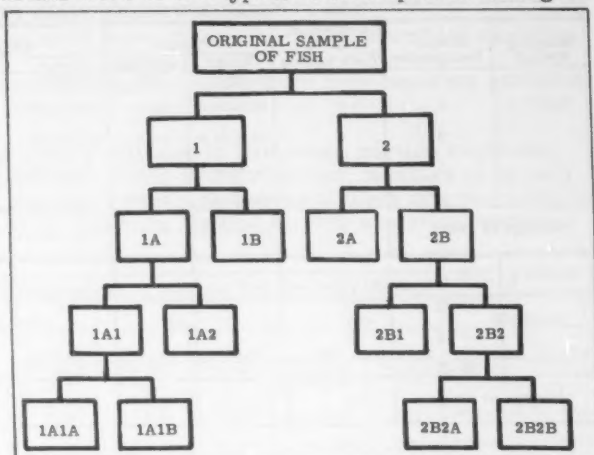


Fig. 2 - Procedure used in method B for obtaining analytical samples. Subsamples 1B, 2A, 1A2, and 2B1 are discarded. Subsamples 1A1A, 1A1B, 2B2A, and 2B2B are taken for analysis.

With the smaller fish (scad and anchovies), a random sample of 20 fish was selected for length and weight measurements as being representative of the whole lot.

Sampling Method	Sample Designation	Number of Fish in Each Sample	Length		Weight		Composition of Sample			
			Range	Average	Range	Average	Protein	Oil	Ash	Moisture
			Cm.	Cm.	Grams	Grams	Percent	Percent	Percent	Percent
Method A	1	4	16.3-17.5	16.8	43.5-61.3	51.4	15.9	1.5	3.15	79.1
	2	4	15.5-18.4	16.9	49.9-62.6	54.4	16.9	2.4	5.07	75.6
	3	4	15.9-17.8	17.0	40.0-61.4	51.2	16.4	2.5	4.74	76.2
	4	4	14.8-17.1	16.7	32.3-50.1	50.4	16.5	2.4	4.97	76.6
Average or range		16	14.8-18.4	16.9	32.3-62.6	51.9	16.4	2.2	4.48	76.9
Method B	1A 1A	-	-	-	-	-	16.9	2.8	5.56	75.4
	1A 1B	-	-	-	-	-	16.6	2.7	5.68	74.9
	2B 2A	-	-	-	-	-	16.5	2.8	6.38	75.5
	2B 2B	-	-	-	-	-	16.3	2.7	5.98	75.2
Average or range		15	13.1-17.5	15.8	24.6-55.8	40.0	16.6	2.8	5.72	75.3

PROXIMATE COMPOSITION

The methods of proximate analysis used were described in detail in Part 1 of this series (Thompson 1959).

A study was made during the fall season in an effort to determine the best methods of sampling and grinding the fish. The procedure in use affords a range of values for each species, as the protein, oil, ash, and moisture content tends to vary within the species in any given season. It was necessary to determine whether this

was a true range or merely represented variations in sampling techniques. Two series of tests were made: one on silver perch and one on white trout. In each series, two methods of preparation were used: Method A and Method B.

Table 2 - Comparison of Sampling Methods A and B--White Trout

Sampling Method	Sample Designation	Number of Fish in Each Sample	Length		Weight		Composition of Sample			
			Range Cm.	Average Cm.	Range Grams	Average Grams	Protein Percent	Oil Percent	Ash Percent	Moisture Percent
Method A	1	2	21.3-24.0	22.7	105.8-133.3	119.6	17.4	7.4	2.41	72.9
	2	2	22.2-23.9	23.1	132.2-141.1	136.7	17.6	7.3	2.56	72.3
	3	2	21.6-24.2	22.9	115.1-136.6	125.8	17.6	4.6	2.86	74.9
	4	2	19.9-21.4	20.7	90.6-104.7	97.7	18.2	5.3	3.89	72.2
Average or range		8	19.9-24.2	22.4	90.6-141.1	120.0	17.7	6.2	2.93	73.1
Method B	1A 1A	-	-	-	-	-	17.6	6.1	3.91	73.1
	1A 1B	-	-	-	-	-	17.5	6.0	3.42	72.7
	2B 2A	-	-	-	-	-	17.6	5.9	3.30	73.0
	2B 2B	-	-	-	-	-	17.9	6.1	3.91	72.9
Average or range		10	20.3-23.7	21.9	93.2-124.7	110.0	17.7	6.0	3.64	72.9

In Method A, the following procedure was employed:

1. Select at random a large lot of fish from an incoming fishing vessel.
2. From the lot, take sufficient silver perch or white trout to make a sample with an aggregate weight of at least 150 to 200 grams.

Table 3 - Location of Catch and Physical Measurements of Industrial Fish Commonly Obtained in the Fall

Name		Date 1958	Location	Total Number of Fish Analyzed	Type of Measurement	Length		Weight	
Common	Scientific					Range Cm.	Average Cm.	Range Grams	Average Grams
Anchovies . . .	<i>Anchoa hepsetus</i>	Oct.	Horn Is.	40	Forktail	10.4-12.7	11.5	10.6-20.4	13.7
Bumper	<i>Chloroscobus chrysurus</i>	Sept.	Gulf Shores	8	Forktail	16.6-29.9	19.2	65.6-97.2	80.3
Butterfish	<i>Poronotus triacanthus</i>	Nov.	Gulf Shores	8	Forktail	8.1-16.0	13.0	16.8-135.6	76.4
Croaker	<i>Micropogon undulatus</i>	Sept.	Gulf Shores	8	Over-all	19.3-21.4	20.7	73.6-110.2	94.7
Croaker, banded	<i>Larimus fasciatus</i>	Nov.	East Gulf	8	Over-all	18.6-20.5	19.5	83.9-124.5	103.1
Grunt	<i>Haemulon</i> sp.	Sept.	Gulf Shores	8	Forktail	13.0-19.0	16.0	31.3-121.7	67.1
Hardheads . . .	<i>Galeichthys felis</i>	Nov.	East Gulf	11	Forktail	14.3-21.8	17.4	40.2-146.7	69.4
Harvestfish ^{1/}	<i>Pepriis alepidotus</i>	Sept.	Gulf Shores	7	Forktail	14.2-16.7	15.3	57.7-84.2	68.8
Menhaden . . .	<i>Brevoortia patronus</i>	Oct.	Pascagoula River	8	Forktail	13.0-18.0	16.3	42.4-122.6	94.8
Razorbellies . .	<i>Barengula pensacola</i>	Sept.	Gulf Shores	20	Forktail	11.8-14.4	13.0	27.8-51.0	38.6
Round herring .	<i>Etrumeus teres</i>	Nov.	East Gulf	11	Forktail	15.1-21.0	18.4	42.2-106.9	75.3
Scad	<i>Trachurus lathami</i>	Oct.	Horn Is.	24	Forktail	10.9-14.4	11.8	15.1-30.0	19.6
Silver eels . . .	<i>Trichiurus lepturus</i>	Sept.	Gulf Shores	4	Over-all	65.0-72.1	67.4	147.1-211.5	179.5
Silver perch Method A . . .	<i>Bairdella chrysura</i>	Oct.	Horn Is.	16	Over-all	14.8-18.4	16.9	32.3-62.6	51.9
Silver perch Method B . . .	<i>Bairdella chrysura</i>	Oct.	Horn Is.	15	Over-all	13.1-17.5	15.8	24.6-55.8	40.0
Spots	<i>Leiostomus xanthurus</i>	Sept.	Gulf Shores	12	Forktail	14.6-16.2	15.4	44.6-62.8	55.1
Threadfin ^{2/} . .	<i>Polydactylus octonemus</i>	Nov.	Sand Is.	16	Forktail	12.9-16.5	14.6	29.7-73.1	47.7
White trout, Method A . . .	<i>Cynoscion</i> sp.	Oct.	Horn Is.	8	Over-all	19.9-24.2	22.4	90.6-141.1	120.0
White trout, Method B . . .	<i>Cynoscion</i> sp.	Oct.	Horn Is.	10	Over-all	20.3-23.7	21.9	93.2-124.7	110.0

^{1/}Figures are from 3 samples, instead of the usual 4.

^{2/}Figures are from 5 samples, instead of the usual 4.

Note: Data on the proximate analysis of these fish are found in table 4.

3. Pass the sample through a food grinder (such as a General Food Grinder, Model H) three times.

4. Take a portion of the ground material for an analytical sample.

5. Repeat steps 2, 3, and 4, so as to form three additional analytical samples.

Thus, in Method A, four analytical samples result from four separate samples of fish.

In Method B, the entire lot is ground, divided in half, each portion reground, and half of the latter portions discarded. Each of the resultant samples is in turn reground, half of each discarded, and the remaining halves divided into two samples for analysis, as indicated in figure 2. Thus, in Method B, four analytical samples also result.

Table 4 - Proximate Composition of Limited Samples^{1/} of Industrial Fish Commonly Obtained in the Fall

Common Name	Total Number of Fish Analyzed	Protein		Oil		Ash		Moisture	
		Range	Average	Range	Average	Range	Average	Range	Average
		Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Anchovies	40	16.1-16.4	16.2	2.7-3.8	3.1	3.53-3.91	3.69	76.6-78.2	77.2
Bumper	8	18.1-19.2	18.6	4.7-5.4	5.1	3.11-5.13	3.91	70.2-75.4	72.2
Butterfish	8	16.1-16.9	16.6	1.5-3.1	2.6	1.92-2.85	2.37	76.9-80.6	78.5
Croaker	8	16.0-17.1	16.5	2.9-4.2	3.6	2.73-5.29	3.96	74.3-76.9	76.0
Croaker, banded	8	17.5-18.1	17.8	1.5-2.8	2.3	3.09-4.54	4.03	74.2-76.9	75.6
Grunts	8	16.0-17.1	16.6	7.1-11.8	9.9	2.99-4.48	3.71	68.1-72.5	70.2
Hardheads	11	15.4-16.0	15.7	7.9-9.7	8.8	4.23-6.31	5.34	69.1-70.8	69.8
Harvestfish ^{2/}	7	18.0-18.5	18.3	2.9-4.7	3.6	2.02-2.94	2.60	74.1-75.9	75.1
Menhaden	8	14.7-14.9	14.8	15.1-16.8	16.0	2.79-3.90	3.39	63.9-66.7	65.4
Razorbellies	20	18.1-18.8	18.5	6.2-7.3	6.7	4.80-6.92	5.82	68.5-70.2	69.0
Round herring	11	18.3-19.0	18.7	1.1-4.7	3.0	3.47-3.82	3.72	73.7-77.1	75.3
Scad	24	16.9-17.5	17.3	2.0-2.5	2.2	3.03-4.28	3.55	76.5-77.6	76.9
Silver eels, (Cutlassfish)	4	17.5-18.0	17.8	1.9-3.3	2.7	3.09-4.04	3.51	75.5-77.8	76.4
Silver perch, Method A	16	15.9-16.9	16.4	1.5-2.5	2.2	3.15-5.07	4.48	75.6-79.1	76.9
Silver perch, Method B	15	16.3-16.9	16.6	2.7-2.8	2.8	5.56-6.38	5.72	74.9-75.5	75.3
Spots	12	16.7-17.1	16.9	2.4-4.1	3.5	3.34-4.31	4.00	75.7-77.3	76.7
Threadfin ^{3/}	16	17.3-18.3	17.8	5.1-8.5	6.8	3.44-4.12	3.75	69.9-72.9	71.7
White trout, Method A	8	17.4-18.2	17.7	4.6-7.4	6.2	2.41-3.89	2.93	72.2-74.9	73.1
White trout, Method B	10	17.5-17.9	17.7	5.9-6.1	6.0	3.30-3.91	3.64	72.7-75.1	72.9

^{1/}The sampling was done by method A, as described under "Proximate Composition." For each species, the data are representative only of the fish of that species landed on one trip by one vessel.

^{2/}Figures are from 3 samples, instead of the usual 4.

^{3/}Figures are from 5 samples, instead of the usual 4.

Notes: Data on the physical measurements of these fish are found in Table 3.

Method A produces four different samples and therefore gives a range of values. Method B produces four samples, all of which should give the same values for a check of the grinding and sampling techniques and, in addition, produces two pairs of samples that should give the same values for a check of the analytical procedure.

Since both original samples for Methods A and B came from the same lot of fish, the mean values for both methods should agree. It was found that the mean of Method A in all cases fell within 3 standard deviations from the mean of Method B. Inasmuch as there is the possibility of variation in size and maturity of the fish at any one time, as well as other factors which seem to influence the proximate com-

position, it was felt that in many instances a range as well as a mean would be desirable. Thus the method giving the range of values (Method A) was chosen in preference to that giving one value for each lot. Tables 1 and 2 show the results of the comparison between these two methods using both silver perch and white trout.

Table 5 - Seasonal Changes in Oil and Moisture Contents--Summer to Fall

Common Name	Change in Oil Content Summer to Fall	Change in Moisture Content Summer to Fall
(Percent).....	
Anchovies	+0.5	-0.1
Bumper	-0.9	+0.9
Butterfish	-3.6	+2.5
Croaker	0.0	0.0
Hardheads	+2.1	-1.2
Harvestfish	-3.9	+2.1
Menhaden	-1.8	+2.1
Razorbellies	+1.7	-2.8
Silver eels (Cutlassfish) .	+0.1	-1.5
Spots	-9.4	+8.6
Threadfin	+5.0	-4.9
White trout	+1.2	-1.2

Note: These estimations are based on only a few samples. Although the estimates represent the best presently available knowledge, further studies may change them.

Results of the present analysis are given in tables 3 and 4. In these tables, the total number of fish used may be divided by four to provide the approximate size of each subsample.

Table 5 indicates the seasonal changes in oil and moisture content of several species. Changes in protein and ash content are small; generally, the ranges overlap from one season to the next. These changes therefore are not presented.

For evaluation of trends, it is advisable to have a large number of samples over a period of years (Stansby 1954). According-

ly, the data accumulated are being presented without discussion in an effort to bring this information before the industry as soon as possible. Parts 1 and 2 of this series (Thompson 1959) together with the present part 3, provide proximate analysis information for some species on a four-season basis, yet the entire picture of fluctuations is not definitive. It will be necessary to obtain more samples to attain any degree of completeness.

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TECHNICAL NOTE NO. 54 - DICARBONYL COMPOUNDS AS COMPONENTS OF FISH ODOR

ABSTRACT

The presence of dicarbonyl and α -hydroxy carbonyl compounds of four carbon atoms or less, are indicated in 2,4-dinitrophenylhydrazine derivatives of mixed carbonyl compounds prepared from fresh and from frozen haddock. These compounds may be important odor and flavor components and possibly could be used as the basis for objective quality tests for fishery products.

INTRODUCTION

It has long been known that dicarbonyl compounds are important contributors to the flavor and odor of foodstuffs. Previous investigators have reported that diacetyl is partially responsible for the flavor and

odor of butter and bread (Van Niel, Kluyver, and Dirx 1929; Hooft, Visser, and DeLeeuw 1935). Keeney (1957) reported the isolation of unknown α , β -dicarbonyl compounds from heated milk; and Underwood, Lerito, and Willets (1956) reported the isolation of a number of α -dicarbonyl compounds from maple syrup. Lundberg (1957) and Privett, Chipault, Schlenk, and Lundberg (1958) reported that the odor and flavor components of oxidized fish oils consist largely of unsaturated carbonyl and dicarbonyl compounds. Sinnhuber and Yu (1958) have suggested that malonaldehyde is the carbonyl compound active in the thiobarbituric acid (TBA) test for oxidative rancidity in fishery products. They refer to the work of Patton and Kurtz (1951) who concluded that malonaldehyde was the compound responsible for the red color developed with TBA reagent in oxidized milk fat.



Fig. 1 - The preparation of derivatives from frozen haddock fillets.

The preparation of derivatives of dicarbonyl compounds from the neutral volatile distillate of haddock fillets are reported in this note.

PROCEDURE

The samples used in these experiments were skinless haddock fillets obtained either from fish that had been out of the water less than 24 hours or from fish that had been frozen and stored for 3 months at 14° F. (-10° C.) and then thawed in air at room temperature for 8 hours. The neutral volatile distillate, which exhibited a characteristic fish odor, was obtained by distilling a 1,500-gram sample of finely chopped fillet at room temperature under a vacuum of less than 1 micron (mercury) pressure. The volatile distillate was collected by condensation in a receiver immersed in liquid nitrogen.

The 2,4-dinitrophenylhydrazine derivatives of the carbonyl compounds present in the distillate were prepared by the method of Neuberg, Grauer, and Pisha (1952).

Fifty milliliters of a 60-percent perchloric acid solution containing 1.2 grams of 2,4-dinitrophenylhydrazine were added to 50 milliliters of the neutral volatile distillate. This reaction mixture was allowed to stand at room temperature for 24 hours. The resulting precipitate was centrifuged, washed with 30-percent perchloric acid and distilled water, and then oven dried at 122° F. (fig. 1).

RESULTS

The 2,4-dinitrophenylhydrazine derivatives were obtained from samples of both fresh and frozen haddock fillets. Although exact quantitative data were not obtained, the yield of 2,4-dinitrophenylhydrazine derivatives from the frozen samples was considerably greater than the yield from the fresh samples. A melting point determination gave little information except to indicate that the precipitate was not a pure compound. The melting point was indefinite, and decomposition of the derivative occurred. The derivatives were insoluble in ethanol and methanol, partially soluble in benzene and dioxane, but soluble in sodium ethylate. In sodium ethylate the derivatives formed a deep violet color, which is characteristic of dicarbonyl and α -hydroxy carbonyl compounds (Neuberg and Strauss 1945). Infrared spectra indicated that the compounds were probably aliphatic in nature and that the greater percentage of the compounds contained four or less carbon atoms.

Dicarbonyl or α -hydroxy carbonyl compounds may prove to be important components of the odors of other fishery products such as fish oil and fish meal. It is also suggested that the production of the violet color by the 2,4-dinitrophenylhydrazine derivatives in sodium ethylate may serve as the basis for an objective quality test for fishery products.

SUMMARY

A neutral volatile distillate from fresh and frozen stored skinless haddock fillets was condensed at liquid nitrogen temperature by distillation at room temperature. A 2,4-dinitrophenylhydrazine solution was added to the distillate, and a precipitate was allowed to form for 24 hours at room temperature. The precipitate was then centrifuged, washed with 30-percent perchloric acid and distilled water, and then dried. No quantitative data were obtained on the amount of derivative formed; however, the frozen fish yielded a greater amount of derivative than did the fresh fish. The melting range of the derivative was large (indicating a mixture, not a pure compound) and decomposition occurred.

Color reaction in sodium ethylate, solubility data, and infrared spectra indicated that the derivatives had been formed from dicarbonyl and α -hydroxy carbon compounds of four or less carbon atoms. The carbonyl compounds may prove to be important components of the flavors and odors in fishery products, and a test for these compounds may serve as objective quality indexes in fishery products.

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SALMON SALAD

The new season's stock of canned salmon becomes available to the consumer towards the latter part of August. There are five separate and distinct species of salmon that comprise the bulk of the salmon canned in the United States. They

are the king, sockeye, silver, pink, and chum. These are all found in the waters of the Pacific extending from Alaska to California.



Almost everyone enjoys the characteristic rich flavor of salmon. The meat is fine in texture, yet firm and moist. The protein content is substantial in quantity and excellent in quality. Salmon contains the important mineral elements calcium, phosphorus, and iodine; and has generous quantities of vitamins A and D, thiamine, and riboflavin.

Each of these species of salmon is equally nutritious, the difference being in the color and oil content of the meat and these differences account largely for the range in price. Thus the budgetwise homemaker is enabled to buy according to her specific needs.

The home economists of the U. S. Fish and Wildlife Service suggest "Salmon Salad."

SALMON SALAD

- | | |
|--|-----------------------------|
| 1 CAN (16 OUNCES) SALMON | 2 TABLESPOONS CHOPPED ONION |
| $\frac{1}{2}$ CUP MAYONNAISE OR SALAD DRESSING | 2 HARD-COOKED EGGS, CHOPPED |
| 1 CUP CHOPPED CELERY | LETTUCE |
| 2 TABLESPOONS CHOPPED SWEET PICKLE | 1 HARD-COOKED EGG, SLICED |

Drain salmon. Break into large piece. Combine all ingredients except lettuce and egg. Serve on lettuce; garnish with egg slices. Serves 6.



TRENDS AND DEVELOPMENTS

Alaska

FISH AND GAME BOARD SETS POLICY: The newly-created Alaska Board of Fish and Game has endorsed the Governor's policy decisions relating to the fisheries resources of Alaska, made prior to the creation of that Board, the Board Chairman announced May 7, 1959.

"The Board is pleased with the stand taken by the Governor on fish and game policy, made by him during the interim period prior to the convening of this Board. We are in complete harmony with the previous action," the Chairman said.

The Chairman and the Board also indicated approval of the selection of Clarence L. Anderson to head the new department. He was selected from a list of seven candidates submitted to Governor Egan by the Board.

"We believe that the first state legislature in the enactment of legislation covering the Department of Fish and Game (Chapter 94, SLA 1959) has created a workable and commendable act. We are in complete harmony and intend to assume the responsibility placed upon the Board by the fish and game legislation," the Chairman continued.

The Board, which convened May 5, has already adopted bylaws governing the meetings of the Board, elected a chairman, made recommendations for a Commissioner to head the department, and met the special legal counsel to the Governor on fisheries. Governor Egan and his counsel outlined the policies adopted by the Governor previous to the activation of the Board, and fisheries counsel briefed the Board on litigation now in progress over fish traps.

* * * * *

FISH AND GAME BOARD PREPARES FOR STATE CONTROL: The Alaska Board of Fish and Game adjourned on May 11, 1959, after providing for immediate assumption of State fish and game control, should Federal authority be successfully challenged in the courts.

The Board laid the groundwork for State control by declaring that an emergency now exists with regard to the question of jurisdiction over fish and game in Alaska. The Board also declared the constitutionality of the Westland amendment to the statehood act is seriously questioned, with the public well aware of it and that, further, this constitutional question raises doubt as to the legality of Federal control of Alaska fish and game.

In a series of resolutions the Board further declared that should Federal control be successfully challenged, a possible enforcement hiatus could encourage violations of the existing laws and regulations.

For the foregoing reasons the Board found it necessary to prepare to assume, at a moment's notice, state control of fish and game.

Therefore the Board prepared, by resolution, to confirm at a moment's notice a full complement of rules and regulations to govern the fishing industry of Alaska by the state agency.

In conformity with Article 4 of the Administrative Procedures Act of 1959, the Board having found that an emergency exists, as above outlined, it ordered the commercial fishery regulations of May 8, 1959, and the sport fish and game regulations of May 8, 1959, under study by the Board since it first met, to be properly identified. The rough draft material accordingly was ordered placed in special folders and signed by the Board and Commissioner as to identity.

The Commissioner was instructed to prepare from the rough drafts a set of clear copies of the regulations to be sent to all members of the Board as soon as possible.

The Commissioner, in event of emergency, has been directed to poll the Board by telegram, telephone, or the quickest means of communication possible, on the following:

- a. Do the facts as outlined constitute an emergency.
- b. Does an emergency now exist?
- c. Do you now wish to adopt the regulations of May 8, 1959?

The Board will answer by return mail.

The proposed regulations largely conform to existing Federal regulations, except where the State Constitution or legislative acts dictate otherwise.

By this means, the Board feels the general public will be appraised of the fact that State jurisdiction will immediately be assumed should Federal control be successfully challenged, with State rules and regulations largely conforming to the Federal acts now governing. Therefore, the possibility of profit by gambling on the question of lack of Federal jurisdiction will be eliminated, the Board feels.

The Board also reconstituted the old local advisory committees which existed under Territorial status, with the proviso that additional committees be appointed to represent areas now without such bodies. Fourteen committees existed under the old department.

"In the past these advisory committees have done a marvelous job of keeping a finger on the pulse of public opinion and generally providing a necessary liaison between the governing bodies and the general public," the Chairman of the Board said.

Guide regulations to be promulgated by the Department were discussed but final action deferred until the October meeting of the Board in order that public opinion could be heard on the matter.

"The Board welcomes any suggestions interested parties may have on these regulations. Preferably such suggestions should be in writing, in order that full and careful study can be made by all members of the Board," said the Chairman.

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California

CRAB AND SHRIMP STUDIED OFF CENTRAL CALIFORNIA COAST (M/V N. B. Scofield Cruise 59-S-2): The Central California coastal waters from the vicinity of Salt Point, Sonoma County, south to Pescadero Point, San Mateo County were surveyed (March 8-April 1, 1959) by the California Department of Fish and Game research vessel N. B. Scofield. The purpose was to conduct crab-trap savings-gear tests by comparing the catches of traps equipped with one 4-inch, two 4-inch, two 4½-inch, and two 4½-inch circular escape ports. These tests were designed to determine the optimum size and arrangement of escape ports for maximum retention of legal males and maximum escapement of sublegal male and female crabs. Other objectives were: (1) to investigate the distribution and relative abundance of juvenile crabs; and (2) to investigate the distribution, size, and sex of shrimp in the Bodega Bay area through exploratory beam trawling.

Crab Escape-Port Tests: Comparison fishing trials were conducted in commercially-productive crab areas, using equal numbers of traps equipped with the four different escape-port arrangements. A total of 224 individual trap sets was made at 4 locations.

Distribution and Relative Abundance of Juvenile Crabs: Dungeness crabs were taken in 20 of 61 tows using a 10-foot beam trawl with 1- to 1½-inch mesh nets. Trawling with commercial size otter-trawl gear with a 4½-inch mesh net and a 2-inch mesh cod end resulted in crab catches at 13 of 16 locations. Catches of juveniles were low for both types of gear and areas of abundance were not located with trawl methods.

PELAGIC FISH AND BARRACUDA STUDIED OFF BAJA CALIFORNIA COAST (M/V Alaska Cruise 59-A-2): The coastal waters off central Baja California, Mexico, from Ballenas Bay northward to San Quentin Bay were surveyed (February 27-March 18, 1959) by the California Department of Fish and Game research vessel Alaska to sample the spring spawning population of sardines. Other objectives were: (1) to sample young sardines from the August-September spawning period off central Baja California; (2) to collect live sardines for genetic studies conducted by the U. S. Fish and Wildlife Service, La Jolla; (3) to sample sardine, Pacific mackerel, jack mackerel, and anchovies for determining their distribution and relative abundance; (4) to troll for surface feeding species of fish; and (5) to develop barracuda tagging techniques prior to the 1959 sportfishing season by catching and tagging whenever possible and observing mortality and tag retention in the live-bait wells.

Seventy-six night-light stations were occupied. At each station fish were attracted by three 750-watt and one 1,500-watt night lights. The lights were placed on both sides of the vessel. After an hour of illumination the 750-watt lights were extinguished the 1,500-watt light was dimmed, and the Bevington blanket net was set. At times, snag

Catches of sublegal male crabs at the trap sites were uniformly low with the exception of the station southeast of Pt. Reyes. The catch of sub-legals was 7.3 per trap at this station. The average catch of sublegal males was 2.4 per trap for all trap sites.

Shrimp: A total of 45 tows were made both on and off the known shrimp beds in an effort to locate shrimp concentrations. These shrimp drags were in the area from Salt Point to Point Reyes. Drags ranged in depth from 20 to 198 fathoms, with the majority in normal shrimp producing depths of 30 to 70 fathoms. No concentrations of shrimp were located although small quantities were taken in 28 of the 55 drags.

The lack of shrimp concentrations in this area at this time of year is not unique. A similar condition was noted in February and March 1957. However, the 1957 season was successful, indicating that though there is a lack of shrimp in the area early in the year, concentrations can appear later.

Carapace measurements were made and stages of sexual development were observed--51 percent of the shrimp were males, 41 percent were females, and 8 percent were transitional between males and females; 29 percent of the females were carrying eggs.

Measurements indicated an average size of 18.8 mm. for males, with modes at 13 and 19 mm. The average size of transitionals was 20.0 mm. and the average size of the females was 21.2 mm.

gangs and lures were used to catch fish, particularly when they were wild and tended to avoid the net.

Sardines were sampled at 10 stations, northern anchovies at 10, Pacific mackerel at 6, and jack mackerel at 5. A total of 487 miles was scouted at night between stations, and 22 sardine, 61 anchovy, 2 Pacific mackerel, and 25 unidentified schools were observed.



Fig. 1 - California Department of Fish Game's research vessel M/V Alaska.

Sardines were sampled and observed most frequently in the Sebastian Vizcaino Bay area between Pt. San Eugenio and Santa Rosalia Bay. Somelarge schools (up to 90 tons) were seen in this area. A large concentration of anchovy schools was present along the east side of Cedros Island.

Sardines were difficult to sample because of their erratic behavior beneath the light. Only two

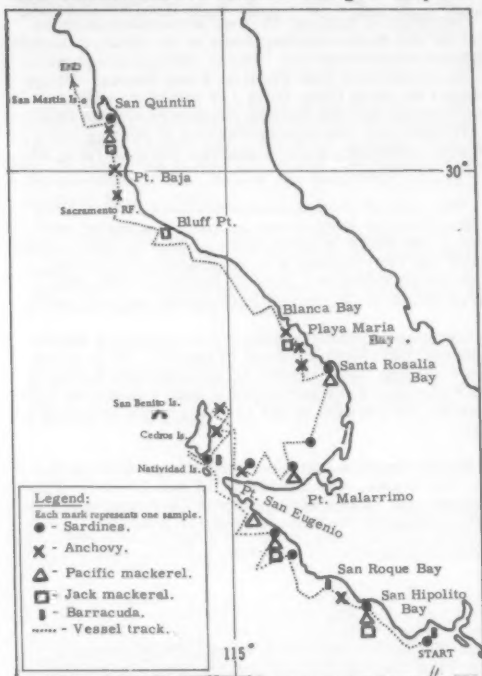


Fig. 2 - M/V *Alaska* Cruise 59-A-2 (February 27-March 18, 1959).

blanket net sets produced 50 or more fish. Many schools remained deep with a few individuals darting to the surface. Schools of this type sounded immediately, when the blanket net touched the water.

Almost all sardines examined had enlarged gonads indicating close proximity to spawning. Lengths of sardines ranged from 120 mm. to 204 mm. with modes at approximately 135 mm. and 165 mm. Larval and post-larval fish were taken at two stations near Cedros Island.

Sea surface temperatures ranged from 14.1° C. (57.4° F.) off Pt. Canoa to 18.4° C. (65.1° F.) in Ballenas Bay. Aside from these extremes, water temperatures were quite uniform, ranging from 16° C. to 17° C. (60.8° F. to 62.6° F.). In general temperatures were nearly 1° C. cooler than encountered during the same time in 1958.

Ninety-three barracuda, caught at three different locations, were tagged and placed in the vessel's bait wells. On March 2, 25 fish caught in Ballenas Bay were tagged alternately with spaghetti-loop tags (13) and tuna dart tags (12). Twenty-one caught off Asuncion Island on March 5 were tagged in the same manner (10 loop and 11 dart). Off Cedros Island on March 8, 47 were tagged (22 with a toggle-type, 21 with darts and 4 with loop tags). The 93 fish ranged in length from 21 to 30 inches.

All the fish were caught with small barbless feather lures. While being tagged, they were held to prevent movement. The dart and toggle tags were placed above the lateral line between the two dorsal fins. The loop tags were inserted slightly posterior to the second dorsal fin.

Only four fish (4.3 percent) died during the cruise. Three of the 44 fish containing dart tags and one of 27 with loop tags succumbed.

A decrease in the abundance of giant kelp (*Macrocystis*) from the previous summer was noted. Kelp beds off Asuncion Island and the mouth of Turtle Bay had nearly disappeared. Other beds were less dense than usual.

* * * * *

AERIAL CENSUS OF COMMERCIAL FISHING CONTINUED: Airplane Spotting Flight 59-4: The inshore area from the Mexican border to the Oregon border was surveyed from the air (March 23-26, 1959) by the California Department of Fish and Game Cessna 170 (1359D) to determine the distribution and abundance of pelagic fish schools.

Although weather conditions were not ideal, some coverage of the entire California coast was possible during the four days devoted to the survey. Visibility north of San Simeon ranged from fair to poor, while atmospheric conditions south of San Simeon were fair to excellent. Strong winds, broken clouds, rain, and low overcast were encountered along the central and north coasts.

Only a few pelagic fish schools were in evidence. No schools were seen north of Morro Bay and only three small unidentified schools were observed south of Newport Beach.

Eighty anchovy schools were present in Estero Bay, between Morro Rock and Estero Point from 1 to 3 miles offshore. All were medium to large in size and were compact and dense in appearance. Sixteen similar anchovy schools were present in the area between Morro Bay and Pt. Arguello and 16 more schools were seen near Santa Barbara.

From 1 to 2 miles offshore between the Santa Monica breakwater and the Malibu pier, 71 anchovy schools were counted. Like those at Morro Bay, they were dense and well defined.

Twenty-nine small, scattered schools of anchovies were observed south of Santa Monica Bay, 4 off Huntington Beach and 25 off Newport Beach.

Generally, dirty water prevailed along the coast, ranging from turbid grey-green and brown to a typical red-tide condition. In Los Angeles-Long Beach Harbor it was red-brown in appearance and

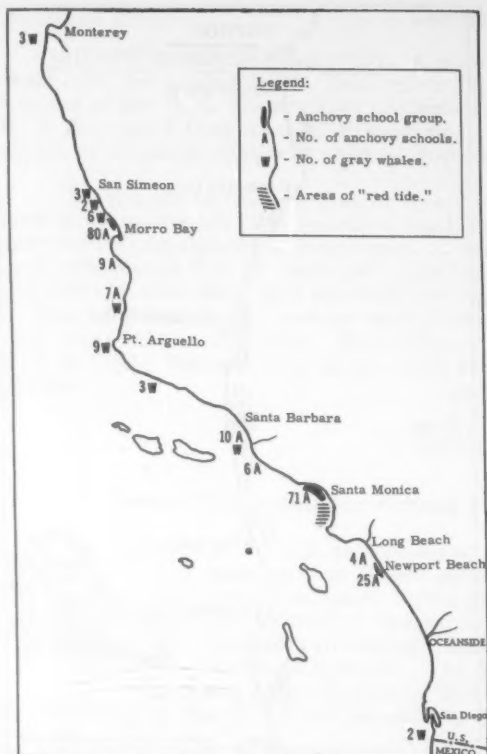


Fig. 1 - Airplane Spotting Flight 59-4 (March 23-26, 1959).

dirty brown water was present from Pt. Fermin to Redondo Beach. An outbreak of red tide was observed between Redondo Beach and El Segundo. It consisted of several "tomato-red" streaks running from shore to about one mile offshore. During the week of the survey, Marineland of the Pacific reported concentrations of 10 million dinoflagellates (40 percent *Noctiluca* sp.) per liter of water in the Palos Verdes Peninsula area.

A total of 44 northbound grey whales was seen; 5 were actively feeding on 7 small "swarms" of euphasiids one-half mile off the town of Mendocino.

Airplane Spotting Flight 59-5: The survey to determine the distribution and abundance of pelagic fish schools was continued (April 13-16, 1959) by the Department's Cessna 170 along the inshore area from the Mexican border to the Russian River.

Poor visibility again hindered observations north of Los Angeles Harbor, but conditions were excellent during the day spent scouting south of there.

Only 24 schools were sighted north of Point Conception; 18 were sardines and were observed off Lucia (between Piedras Blancas and Pt. Sur). All were large, well defined spots. Six medium-size anchovy schools were present just outside Morro Rock.

What appeared to be a large concentration of sardines was noted between Point Conception and a point a few miles north of Goleta, extending one to four miles offshore. Schools within this group were deep and varied in size. Some were small spots, but the majority were quite large and dense. Positive identification was difficult, but these schools were in clear blue water and behaved in a manner typical of sardines.

Three small school groups of anchovies were observed between Goleta and Point Mugu. Each was within one mile of shore and was composed of a thin, stringy, almost continuous mass of fish. In the case of the group seen off of Ventura, an approximate count of the number of schools was impossible.

Los Angeles-Long Beach Harbor contained 153 anchovy schools, the majority at the San Pedro end of the harbor.

A large concentration of anchovies was present between Seal Beach and Newport Beach. These fish were noted in the surf line and offshore to about one mile. The water in the area was dirty green-brown in color.

Eleven scattered sardine schools were seen between Newport Beach and La Jolla.

Forty-one anchovy schools and three schools of yellowtail were counted between Mission Bay and Point Loma.

Thirty-one anchovy schools were observed close to shore along the Coronado Strand.



Fig. 2 - Airplane Spotting Flight 59-5 (April 13-16, 1959).

Only six gray whales were sighted during this flight. A female and calf were resting at the surface in a kelp bed about one-quarter mile offshore near Gaviota.

The water in the inshore area of Santa Monica Bay was again quite dirty, but no intense outbreak of red tide was observed.

Airplane Spotting Flight 59-6: The coastal waters from Monterey to the California-Oregon border were surveyed from the air (April 15-16, 1959) by the Department's *Cessna 180* to determine fishing localities and relative fishing intensity of the northern California crab fleet.



Fig. 3 - Flight Report of *Cessna 180* (59-6--April 15-16, 1959).

Note: Also see *Commercial Fisheries Review*, March 1959, p. 26; and June 1959, p. 28.

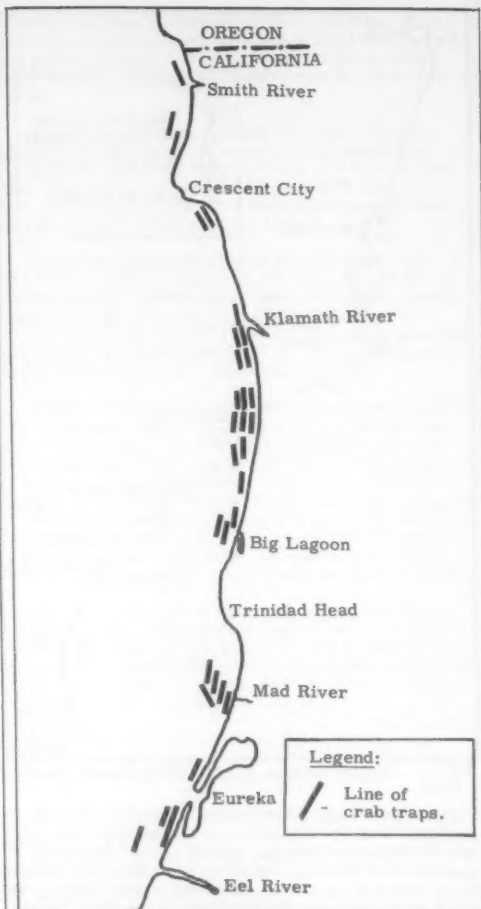


Fig. 4 - Flight Report of *Cessna 180* (59-6--April 15-16, 1959).

Strong northwest winds and heavy seas hampered observations of crab trap buoys in the survey area north of the Golden Gate. Adverse flying conditions forced the abandonment of observations in the area between the Eel River and Point Arena.

Thirty-four trap lines were sighted in the area between the Eel River and the Oregon border, the majority in shallow depths. Concentrations of gear were found between the Klamath River and Big Lagoon.

Twenty-nine lines of crab gear were observed between the Russian River and Martin's Beach, with the greatest concentration off Stinson's Beach in shallow to moderate depths. Four lines were seen in Monterey Bay off Moss Landing.



Canned Fish

SHIPPING METHODS STUDY: A survey of canned fish distribution in the United States for the period July 1-December 31, 1958, has been made by the Bureau of the Census of the U. S. Department of Commerce. Arrangements have been made by the U. S. Bureau of Commercial Fisheries to obtain information on transportation aspects, or shipping methods used to ship those products.

The Bureau is financing an analysis of the data obtained, so as to provide information on the average length of haul, freight rates, and volume shipped to the various rail freight-rate territories of canned tuna, salmon, and sardines. Separate tabulations will be made for each one of those canned fishery products. A supplementary tabulation will show percentage distribution of the number of shipments by size of sales invoice and by type of carrier for all the larger packers canning each one of those products. The study is expected to be completed late in the summer of 1959. Subsequently an analysis for the first six months of 1959 may be undertaken.



Cans--Shipments for Fishery Products, January-March 1959



Total shipments of metal cans during January-March 1959 amounted to 19,450 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 23,189 tons in the same period a year ago. Canning of fishery products in January-March this year was confined largely to tuna and Gulf oysters. The decline in the shipment of metal cans during January-March this year as compared with the same period

in 1958 may be due to lighter advance orders for cans for the 1959 salmon canning season.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Clams

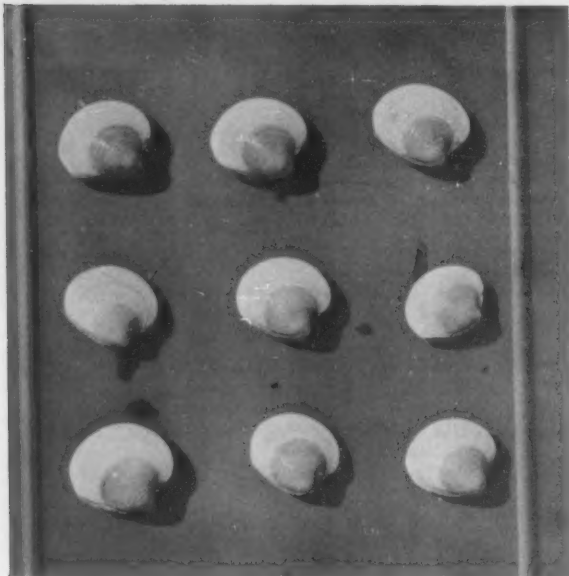
STUDIES DEVELOP SOURCE OF SEED AND PLANTING TECHNIQUES: Days of plenty for the people of two continents who like hard-shell clams seem to be in the making. Two developments are climaxing years of hard work on the part of biologists of the U. S. Bureau of Commercial Fisheries, the Bureau announced on April 30.

One is that a source of "seed" has been proved and can be developed. The other is proof that "seed" can be planted under conditions which will assure clams of the littleneck or cherrystone size a year after spawning.

The story in brief is a victory over the numerous predators which attacked the clam at every cycle of development. The big problem in hard-shell clam propagation has been getting the seed. Oyster set could be secured in many places but not so with hard-shell clams. The clam fishery was dependent entirely upon natural sequences, many of which were not so good.

Eight years ago, scientists at the Bureau of Commercial Fisheries' shellfish laboratory at Milford, Conn., began work on producing clam "seed" from parent

clams held in the laboratory. That task has been successfully completed and a technique for captive culture has been devised. The laboratory-spawned clams have been planted in predator-protected areas and have thrived.



New England seed of the hard clam, *Mercenaria mercenaria*, transplanted to Florida grew new shell (white portion) during January-March 1959.

The result is that the Milford laboratory has shipped upwards to a million of these tiny creatures to various parts of the Atlantic coast to investigate their rates of growth and survival under widely different environmental conditions.

Clams--one-sixteenth of an inch long--which the Milford laboratory shipped to Florida State University for planting in warm Gulf waters under predator-free conditions developed into 2.5-inch restaurant-size specimens in just a year. In colder areas it takes as long as 3 or 4 years for clams to make that growth.

The laboratory also has just recently shipped 150,000 small hatchery-bred clams to England and France for a new start in the clam fisheries in those countries.

Thus the long hours at the laboratories have not only shown the clam industry how to produce seed clams necessary for a stable fishery but have made it possible for the producer to put his plantings in areas which can be protected from predators.

Other research by the Bureau is perfecting control methods for clam predators and improving "fences" or barriers used to keep the predators away from the clam beds. Still another study is probing the effect of silting and other water conditions upon this important shellfish.

Note: Also see *Commercial Fisheries Review*, June (1959), p. 33.



Crabs

GREEN CRABS CONTROLLED WITH CHEMICAL: To control the green crabs which destroy clams, the Bureau of Commercial Fisheries Biological Laboratory at Boothbay Harbor is using lindane. Samples of green crabs taken in February 1959 from burrows in creek banks near Wells, Me., support previous observations that the lindane barrier was effective during the past summer months. After digging in many places along the banks within the protected area, the biologists found only five small crabs while one five-foot section of a creek outside the barrier area contained about 200 crabs of all size classes.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-APRIL 1959: Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department

of Defense, 2.2 million pounds (value \$1.0 million) of fresh and frozen fishery products were purchased in April 1959 by the Military Subsistence Market Centers. This exceeded the quantity purchased in March by 8.2 percent, but was 2.0 percent under the amount purchased in April 1958.

The value of the purchases in April 1959 was lower by 16.7 percent as compared with March and 17.5 percent less than for April 1958.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Market Centers, April 1959 with Comparisons							
QUANTITY				VALUE			
April		Jan.-Apr.		April		Jan.-Apr.	
1959	1958	1959	1958	1959	1958	1959	1958
..... (1,000 Lbs.) (\$1,000)			
2,188	2,232	7,137	7,256	982	1,190	3,782	4,142

During the first four months of 1959 purchases totaled 7.1 million pounds (valued at \$3.8 million)--a decrease of 1.6 percent in quantity and 8.7 percent in value as compared with the similar period in 1958.

Prices paid for fresh and frozen fishery products by the Department of Defense in April 1959 averaged 44.9 cents a pound, about 13.4 cents less than the 58.3 cents paid in March and 8.4 cents less than the 53.3 cents paid during April 1958.

The lower average price for purchases this April was due to a sharp drop in fillet prices and smaller purchases of shrimp and oysters.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers, April 1959 with Comparisons

Product	QUANTITY				VALUE			
	April		Jan.-Apr.		April		Jan.-Apr.	
	1959	1958	1959	1958	1959	1958	1959	1958
 (1,000 Lbs.) (\$1,000)			
Tuna	539	543	1,408	955	271	264	658	482
Salmon	-	86	-	1,327	-	51	-	724
Sardine	15	9	280	33	6	4	46	12

Canned Fishery Products: Tuna was the principal canned fishery product purchased for the use of the Armed Forces during April this year. In the first four months of 1958, purchases of canned tuna were up

47.4 percent and canned sardines were up eightfold as compared with the same period in 1958. No canned salmon was purchased during January-April 1959 as compared to 1.3 million pounds in the same months of 1958.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.



Great Lakes Fishery Investigations

PROGRAM OF THE RESEARCH VESSEL "CISCO" FOR 1959: During 1959 the U. S. Bureau of Commercial Fisheries research vessel Cisco will operate along the south side of Lake Superior, east of the Keweenaw Peninsula. Primary objectives will be to determine the abundance, composition, and distribution of the fish stocks, with emphasis on lake trout and chubs.

Much of the life-history and population studies of lake trout conducted in 1953 by the Cisco will be repeated this year to determine what changes have taken place during the past 6 years of severe sea-



Cisco, research vessel of the Service's Great Lakes Fisheries Investigations.

lamprey infestation. Major attention will be given the younger lake trout since information on them is least available from the commercial fishery. The small trout will be sampled with trawls and small-mesh gill nets. The abundance and distribution of spawning lake trout will be studied, when large-mesh gill nets will be set over known spawning grounds. All spawning trout and some smaller



SEA LAMPREY FEEDING ON A TROUT.

trout will be tagged and released. The lake trout data collected by the Cisco should add materially to the information gathered by other means so that a good idea of the present lake trout stocks and of the contribution of the hatchery-reared trout can be obtained.

Collections of trout and of other species will be made with gill nets set systematically in various areas. Sets will be mostly at 15, 25, 50, 75, and 100 fathoms, and the nets will contain the following mesh sizes: 1½, 1½, 2, 2½, 2½, 3, 3½, 4, 4½, 5, 5½, and 6 inches extension measure. The information obtained from these nets may give an accurate enough picture of present populations, especially of lake trout and chubs to permit assessment in future years of the changes brought about by the anticipated drastic reduction in sea lamprey populations.

Limnological investigations will be more limited than in 1953, but some of the same areas will be sampled to detect environmental changes which might have occurred. Collections and observations will include plankton, bottom organisms, water for chemical analysis, water temperatures, Secchi-disc readings, and water currents.

* * * * *

WESTERN LAKE SUPERIOR FISHERY SURVEY (M/V Siscowet Cruise 1): The first cruise of the U. S. Bureau of Commercial Fisheries research vessel Siscowet during the 1959 season was conducted (April 27-May 6, 1959) in the Apostle Island area of western Lake Superior. Objectives of the cruise included studies on various species of chubs, and trawling with small-mesh trawls for fry and yearling stages of whitefish, lake trout, menominee whitefish, herring, and smelt. Trawling and gill-net fishing were conducted southeast of Stockton Island, south of Oak Island, west of Manitou Island, southeast of Rocky Island, east of Manitou Island, and south of Long Island in Chequamegon Bay. A small mesh net was also towed to capture fish larva. Bathythermograph casts were made at each station.

Gill nets (1-, 1½-, 2-, 2½-, 2½-, and 3-inch mesh) were fished to sample various size groups of the species mentioned above. Chubs (*Leucichthys hoyi* and *L. zenithicus*) dominated the catch in 50 fathoms southeast of Stockton Island. The condition of the gonads suggested these fish had spawned last fall or early winter. The catch from nets set south of Long Island was light, consisting of very few herring, menominee whitefish, white sucker, perch, and walleye. Nets set southeast of Rocky Island caught 370 menominee whitefish varying in size from 4 to 17 inches. East of Manitou Island a set was made on a bank varying in depth

from 25 to 35 fathoms. *L. hoyi*, menominee whitefish, and longnose suckers dominated the catch. Seven small (6 to 11 inches) lake trout were also captured. South of Oak Island the catch from two sets consisted mainly of *L. hoyi* and smelt. Thirteen small (4 to 16 inches) lake trout and 16 (6 to 13 inches) whitefish were also taken.

Trawl catches were generally light. One 24-minute tow south of Oak Island took over 1,000 smelt (4 to 8 inches) and 2 small lake trout. Tows made southeast of Stockton Island took small numbers of slimy muddlers, ninespine sticklebacks, smelt, and johnny darters. Because of the poor catches in this area tows were conducted at night to determine if larger samples could be collected by trawling after dark. Nighttime trawl catches were increased by the addition of menominee whitefish to the catch. A total of 89 menominee whitefish were taken in one tow.

Tows were made with the fish-larva net over the rocky bottom west of Michigan Island. No fish were captured.

Surface temperatures varied from 35.0° F. southeast of Stockton Island to 41.5° F. south of Long Island in Chequamegon Bay. There was no evidence of stratification at any of the stations visited as temperatures remained fairly constant from surface to bottom.

* * * * *

WESTERN LAKE ERIE BIOLOGICAL RESEARCH CONTINUED (M/V "George L." Cruises 1 and 2): The U. S. Bureau of Commercial Fisheries research vessel Musky, used on Lake Erie in 1957 and 1958, was found to be unseaworthy and the vessel was destroyed after the engine and equipment were removed. A 34-foot trap-net boat, the

George L., was leased for 1959 to continue biological research on Lake Erie fish.

Cruise 1 (January 1-March 1959): Thick ice formed over western Lake Erie during a severe winter but most of it had disappeared by April 1. A two-day limnological and fish population study

was made through the ice near South Bass Island in February in cooperation with the Ohio Division of Wildlife. The water temperature was 34° F.; few fish were caught.

The Madtom, a 16-foot boat equipped for trawling, is used as an auxiliary to the George L. for work in very shallow water. Trawl catches by the Madtom in Sandusky Bay and Cedar Point-Huron area in March consisted mostly of yellow perch, emerald shiners, and spot-tail minnows. Few fish were found in waters less than 10 feet deep.

Cruise 2 (April 1-30): The George L. was given a test run on April 15 when several trawl tows were made off Cedar Point Beach and in Sandusky Bay. Large numbers of spot-tail minnows were taken. Many yellow perch eggs were found on a gill-net set overnight although none of the numerous female perch taken by trawl and gill net appeared to be ripe or spent. Water temperature was 47° F. Most of the perch in Sandusky Bay had spawned by

April 30, but a large percentage of the female perch captured in the lake were still full of eggs.

Samples of important species of fish in the commercial catch were taken at several ports in Ohio. The Pennsylvania Fish Commission assisted by collecting samples in Pennsylvania ports. Catches of yellow perch and sheepshead were high and catches of walleye were fair in Ohio waters. Cold water and ice greatly limited fishing in Pennsylvania and New York.

Most of the yellow perch taken in the commercial fishery of Ohio were 3 years old, but about 50 percent of the catch was less than 8.5 inches long and had to be returned to the lake. Walleyes or yellow pike taken were mostly "jumbo" or "No. 1"—few smaller fish were caught.

Environmental conditions in several areas in western Lake Erie were examined during the yellow pike and yellow perch spawning period by the Ohio Division of Wildlife and the Bureau's Laboratory.

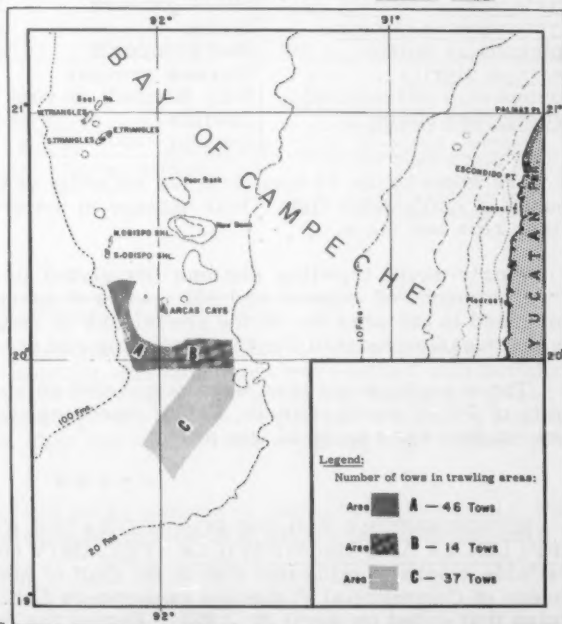


Gulf Exploratory Fishery Program

COMMERCIAL RED SNAPPER TRAWLING OPERATIONS ON CAMPECHE BANK COMPLETED (M/V Silver Bay Cruise 16): A total marketable catch of 21,471 pounds (19,166 pounds of snapper and 2,305 pounds of grouper) was taken in 18 fishing days by the U. S. Bureau of Commercial Fisheries' exploratory fishing vessel Silver Bay, while conducting simulated commercial red snapper trawling operations on Campeche Bank in April 1959. Trawling operations were confined to three areas in the vicinity of Cay Arcas, where concentrations of snapper (Lutianus sp.) had been located during previous Silver Bay cruises. This cruise completes the programmed study of availability of red snapper to trawling gear.

A total of 97 trawl stations were completed in depths ranging from 21 to 55 fathoms. With the exception of three stations at which a new type 88-foot square trawl (no top square) was tested, all trawl stations were made with a 54-foot headrope-74-foot footrope nylon trawl rigged with 20-inch rollers the full length of the footrope and fished with standard V/D rig between the doors and the trawl. The trials with the 88-foot square trawl indicated a marked decrease in catching efficiency as compared to the standard trawl.

The catch (see table) was comprised of five species of snapper and six species of grouper. Approximately 75 percent of the snapper were red snapper (Lutianus aya);



M/V Silver Bay Cruise 16 (April 2-May 6, 1959).

approximately 50 percent large (10 pounds or over), 20 percent medium (5-10 pounds) and 30 percent small fish (1-5 pounds). Negligible amounts of small, unmarketable snapper were taken due to the use of a large-mesh cod end.

Best fishing was encountered in Area A (see chart) in 38 to 45 fathoms. Forty-six trawl drags in this area produced 11,904 pounds of red snapper and 902 pounds of grouper. Catches averaged 2,000 pounds per 12-hour fishing day with individual catches ranging from 115 to 1,000 pounds per 90-minute tow. The bottom was characterized by a sand and gravel bank which sloped gently from 38 to 55 fathoms with approximately 14 miles of clear trawling bottom extending in a northwest-southeast direction. No gear was damaged or lost in this area.

Fourteen tows in Area B failed to produce profitable catches of snapper and grouper, although the bottom throughout the area was characterized by broken coral and sponge formations. A total of 1,283 pounds of snapper and 410 pounds of group-

Table 1 - Catch of Snapper and Grouper by M/V Silver Bay during Cruise 16

Species	Common Name	Weight		
		Total	Average	Range
			(Lbs.)	
<u>Lutianus aya</u>	Red snapper	14,271	8	1- 20
<u>Lutianus analis</u>	Mutton or king snapper	3,760	10	5- 22
<u>Lutianus synagris</u>	Lane or rainbow snapper	624	1½	1- 4
<u>Lutianus apodus</u>	Schoolmaster snapper	251	5	2- 10
<u>Lutianus griseus</u>	Gray snapper	175	20	5- 30
<u>Lutianus vivanus</u>	Yelloweye or silk snapper	11	4	3- 5
<u>Lachnolaimus maximus</u>	Hogfish	74	5	2- 8
		19,166		
<u>Mycteroperca bonaci</u>	Black grouper	948	15	6- 30
<u>Mycteroperca falcata</u>	Scamp	628	8	2- 10
<u>Epinephelus morio</u>	Red grouper	427	10	4- 12
<u>Garrupa nigrita</u>	Warsaw grouper	20	12	8- 15
<u>Epinephelus adscensionis</u>	Katy Mitchell or rock hind	22	3	1- 6
<u>Promicrops itaira</u>	Jewfish	260	130	60-200
		2,305		

er were taken in the 14 tows with the majority of the tows producing less than 100 pounds of marketable fish. Gear damage in the area was light and was confined to minor rips and tears.

Thirty-seven trawling stations completed in Area C resulted in a total catch of 5,979 pounds of snapper and 993 pounds of grouper. Severe gear damage was experienced in the area due to the prevalence of large coral formations and rocks, and on one occasion most of the trawl webbing and one trawl board was lost.

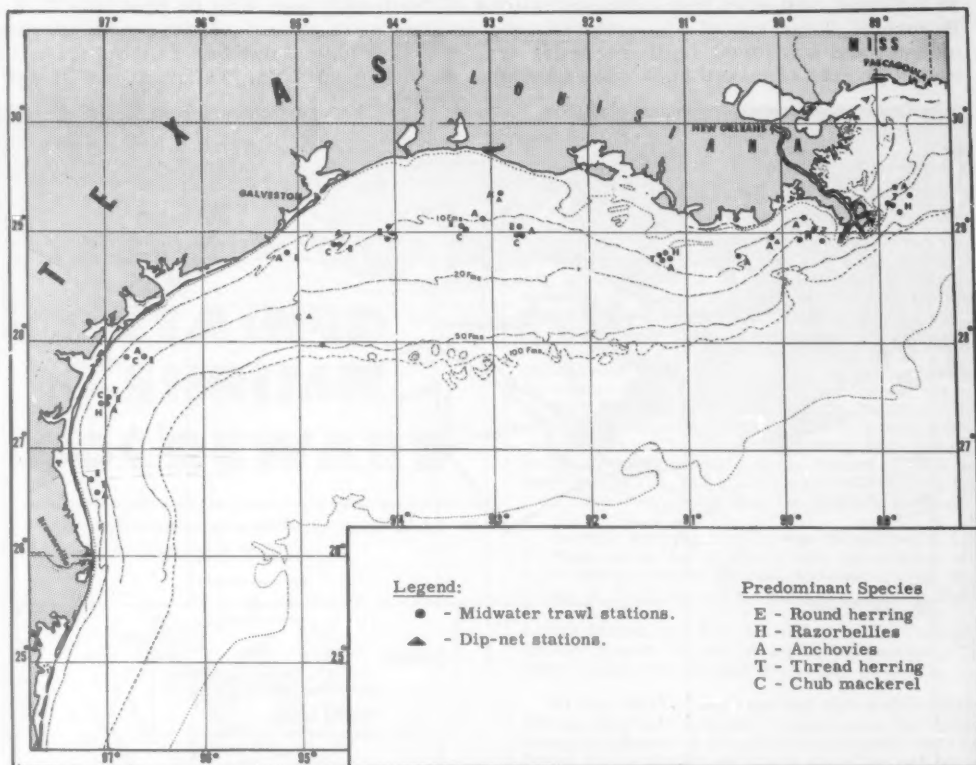
Three exploratory tows were completed on rocky and broken bottom in the vicinity of 24°10' north latitude, 97°25' west longitude in 22 to 49 fathoms. No significant catches were made in this area.

* * * * *

EXPLORATORY FISHING FOR MIDWATER FISH STOCKS BETWEEN MISSISSIPPI DELTA AND BROWNSVILLE, TEX. (M/V Oregon Cruise 58): The survey of available stocks of midwater fish in the Gulf of Mexico was continued by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon on a 23-day cruise that ended on April 30, 1959. During the cruise the vessel made 41 tows with 40- and 60-foot nylon midwater trawls in the 5-50 fathoms depth range between the Mississippi Delta and Brownsville, Tex.

Between Brownsville and Aransas Pass, Tex., numerous schools of mixed small thread herring (*Opisthonema*), razorbellies (*Harengula*), chub mackerel (*Scomber*), and round herring (*Etrumeus*) were encountered. All catches indicated that only small juvenile fish were present, and escapement through the meshes was heavy.

From Aransas Pass to Cameron, La., midwater fish schools were light and scattered. When sampled they yielded round herring, anchovies (*Anchoa*), and chub mackerel. Again all catches contained only very young fish and the apparent escapement was great.



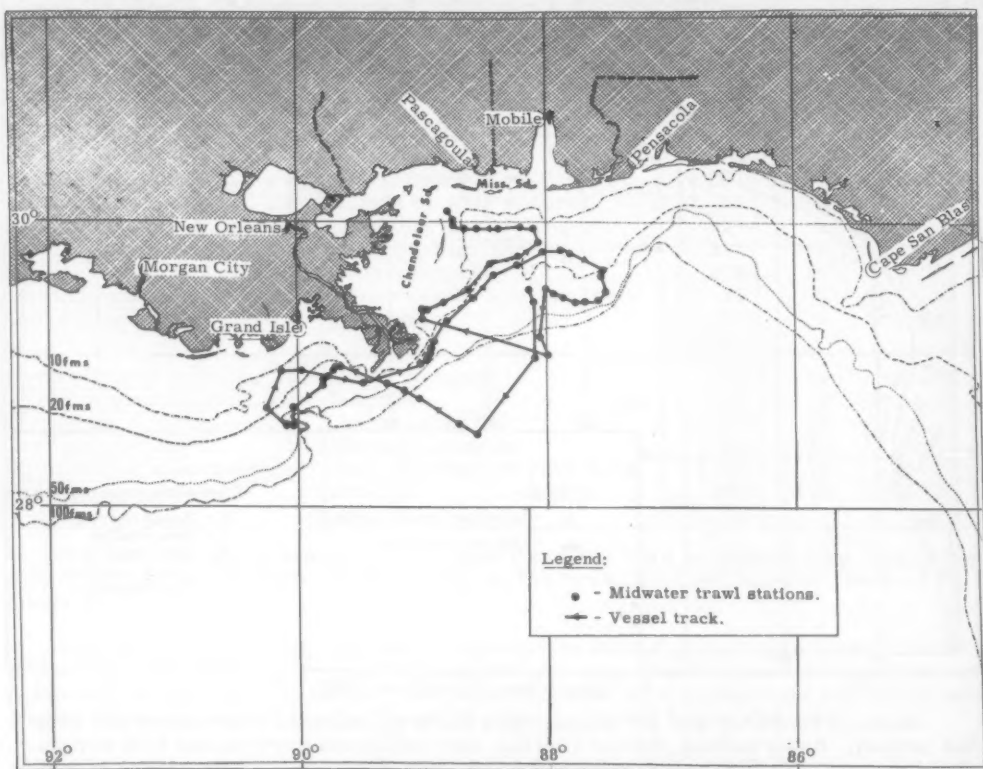
M/V Oregon Cruise 58 (April 8-30, 1959).

Between Cameron and the Mississippi Delta the schools were dispersed near the bottom. Razorbellies, thread herring, and anchovies were mixed with bottom-dwelling species. Several of these tows had up to 500 pounds of anchovies mixed in a 1,500-pound catch. The gear was subjected to some unplanned durability tests off Mississippi River Southwest Pass when two manta rays weighing approximately one ton each were caught.

Southwest of Ship Shoal numerous large schools of menhaden (*Brevoortia*) were seen at the surface. Efforts to catch these during both day and night drags were unsuccessful.

MIDWATER TRAWLING FOR SCHOOL FISH IN THE NORTH CENTRAL GULF OF MEXICO (M/V Oregon Cruise 59): Round-the-clock scouting transects and trawling operations, designed to provide additional information on the seasonal occurrence of school fish and their availability to midwater trawling gear, was accomplished during the May 20-27, 1959, cruise of the M/V Oregon. A total of 60 tows was made using 40- and 60-foot square midwater trawls of nylon mesh varying in size from 5 inches in the wings to $\frac{1}{2}$ inch in the bag.

With few exceptions, observed schools were confined to waters shallower than 20 fathoms, and even there concentrations of the density met with on previous U. S. Bureau of Commercial Fisheries Oregon cruises were absent. Most sets were made on light and scattered depth-recorder traces and produced catches ranging from 10 to 200 pounds of mixed anchovies (*Anchoa*), scad (*Decapterus*), razorbellies (*Haren-*



M/V Oregon Cruise 59 (May 20-27, 1959).

gula), and round herring (*Etrumeus*). Best midwater catches were obtained immediately before sunset and after sunrise when the fish schools were presumably at a point midway between their nighttime surface and daytime bottom positions. Night-time midwater trawling was unproductive as was "blind" towing.

Near-bottom trawling, conducted east and west of the Mississippi River Delta at regular intervals, resulted in up to 3,000 pounds of mixed industrial fishes--predominantly croakers, spot, and porgies. Best near-bottom catches were obtained east of the Delta.

It is becoming increasingly evident that the art of midwater trawling differs considerably from that of bottom trawling and that comprehensive gear studies are indicated if optimum efficiency is to be obtained. Direct observation of the midwater gear by SCUBA divers is being planned for future cruises.

Numerous schools of surface fish were observed east of Pass-a-Loutre and were tentatively identified as small anchovies.

Samples were collected and frozen for future study by Service technologists.

Gulf Fishery Investigations

Following are some of the highlights of the studies conducted by the Galveston, Tex., Biological Laboratory of the U. S. Bureau of Commercial Fisheries during January-March 1959.

SHRIMP: In January, a thorough coverage of shrimp landing ports in Florida was undertaken to

provide for recovery of stained shrimp released in the nursery grounds of upper Florida Bay. Fort Myers, Tampa, and all ports along the west coast were included as well as Key West and Marathon and Stock Island.

The first probable recovery of a stained shrimp was reported during this period. Four verified recoveries of stained shrimp released at Flamingo were taken on the Tortugas grounds and turned in by shrimp fishermen. The trypan blue stain used remained clear in shrimp recovered after fully 3 months and 26 days "out time." Calculated from the center of the 8-day release period and the mean release size, pink shrimp from the National Park nursery grounds grew at the rate of 3 mm. carapace length per month while moving 90 to 100 miles to the Tortugas trawling area. Stated another way, these small 120-140 count (heads-off) shrimp tripled their weight in a four-month period.

Another staining project was completed at Lower Matecumbe Key in March with the release of 4,000 shrimp taken, stained, and released on the fringe of Everglades National Park in outer Florida Bay. The first recovery from these releases near Lower Matecumbe Key showed up in the Tortugas fishery March 16, just 46 days after release. The shrimp had traveled approximately 74 miles.

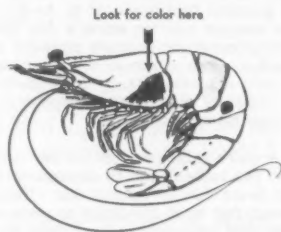
At Key West it was reported that a blue-stained shrimp had been definitely picked up in the Atlantic Ocean southwest of Marathon in January--this is listed as a probable recovery since the shrimp was never turned in. This report partly confirms thinking on migration routes of pink shrimp entering the Tortugas grounds from upper Florida Bay. Large numbers probably move south through the Keys particularly at Channel Two, Whale Harbor, Tea Table Key, and Bahia Honda Key. These shrimp then move down Hawk Channel westward to the area of Marquesas Keys then north and northwestward across the Tortugas grounds.

One problem in shrimp staining has been the limitation of only three available colors. This could lead to confusion if too many releases were made in contiguous areas over a short period. By mixing stains, two additional colors, purple and brown, have been developed.

Analysis of data on seasonal changes in size and species composition of trawl hauls in Clear Lake were continued this quarter. Effort was concentrated on analyzing stomach contents of fish

STAINED SHRIMP 50¢ REWARD

Shrimp have been marked with blue, green and red biological stains — in order to obtain information on migrations and growth. The color appears only on both sides of the head (in the gills) as shown in the illustration.



A reward of 50¢ will be paid for stained shrimp when returned with the following information:

1. Exact place the shrimp was caught.
2. Date the shrimp was caught.

NOTIFY BY MAIL THE U. S. FISH AND WILDLIFE SERVICE, BIOLOGICAL LABORATORY, P.O. BOX 3098, GALVESTON, TEXAS, OR CONTACT ANY FISH AND WILDLIFE SERVICE AGENT OR REPRESENTATIVE.

Stained shrimp must be verified by Fish and Wildlife Service biologist before payment. The stains used are approved for this use by the Food and Drug Administration.

Fig. 1 - Poster placed at key points in the Gulf States area encouraging the return of stained shrimp.

collected in the lake during the past year to determine the degree of predation by juvenile fishes on post-larval and juvenile penaeid shrimp.

Thus far, 1,723 fish stomachs collected from January through July 1958, have been studied. They include 870 croakers (*Micropogon undulatus*); 216 sand trout (*Cynoscion arenarius*); 26 spotted trout (*Cynoscion nebulosus*); 52 redfish (*Sciaenops ocellatus*); 71 spotfin whiffs (*Citharichthys spilopterus*); 35 spot croakers (*Leiostomus xanthurus*); 50 gafftopsail catfish (*Bagre marinus*); 13 hard-head catfish (*Galeichthys felis*); and several minor species numbering ten or fewer specimens each.

The dominant type food organism in the stomachs examined are listed in decreasing order of percentage frequency occurrence: copepods, mysids, fish, polychaetes, amphipods, decapods (mostly grass shrimp and crabs), isopods, and insects.

The most abundant game fish, croaker, apparently fed on penaeid shrimp to a very limited extent; major food items included copepods, mysids,



and fish. Of the other gamefishes, redfish and spotted trout did not occur in abundance at the lake except when post-larval penaeid shrimp were absent. The sand trout, also a game fish, fed mainly on mysids and larval grass shrimp and to a lesser extent, post-larval penaeids.

An interesting aspect of the results to date is that although several species of fish were present during a period of abundance of penaeid post-larvae, their stomachs contained mostly other crustacea, viz., copepods, mysids, grass shrimp larvae, and amphipods.

RED TIDE STUDIES: Studies to determine the nutritional value of specific trace metals were continued. Preliminary results indicate that media containing molybdenum, strontium, barium, rubidium, manganese, zinc, titanium, and zirconium were as good or better for the growth of *Gymnodinium breve* than control media with no trace metal additives. On the other hand, media containing chromium, vanadium, aluminum, nickel, and copper did not improve growth with the concentrations used.

Experiments were conducted to determine the effects of variations of the calcium and phosphorus content of media on the growth of *G. breve*. The results indicate that *G. breve* will not grow in media if the calcium content is less than .05 grams per liter or greater than 2.5 grams per liter. Within the above range, growth depends on the phosphorus concentration. More phosphorus is required if the calcium concentration is low and less phosphorus if the calcium concentration is high. These results indicate that a balance of calcium and phosphorus is required for good growth of *G. breve* and that

specific ratios of these elements may be necessary for blooms of this organism to develop.

Investigation of the temperature tolerance of cultures of *G. breve* has been continued during this quarter. The absolute low limit of temperature tolerance seems to be about 7° C. (44.6° F.)--for 10 ml. cultures maintained at a distance of two inches from a 14-watt fluorescent tube. The time required for this temperature to be lethal is apparently related to the rapidity with which the test cultures are cooled to this level.

At the other end of the tolerance range, a temperature of 30° C. (86° F.) reduced culture populations to less than 10 percent of the initial level after one week of exposure. Four hours of exposure to 35° C. (95° F.) reduced the culture populations to less than one percent of the original level. Twenty-four hours at this temperature was found to be 100 percent lethal.

Attempts to determine the effect of pH's above 8.2 on the growth of *G. breve* have not been successful thus far.

The screening of organic chemicals was started during the latter part of this quarter. The object of this program is to discover organics with specific toxicity to *G. breve*. Thus far, a dozen of the hundred or so chemicals screened have shown various degrees of toxicity. Of these, three killed all organisms within a 0.01 to 0.04 p.p.m. range.

A total of 369 samples were collected during this period and *G. breve* were present at 27.4 percent of the stations. The northern range of *G. breve* is now limited to the St. Petersburg Beach area, although *G. breve* were still found south along the coast to Venice and from the mouth of Tampa Bay to 40 miles offshore. No *G. breve* were in the fresh and brackish water samples taken in Tampa Bay. The general incidence of *G. breve* decreased even in the deeper neritic waters due mainly to the adverse environmental factors present during the winter months. The vertical distribution of this organism still exhibits patchy distribution and due to the low range of numbers no apparent diurnal migration can be shown.

G. breve were still present as far offshore as we sampled (40 miles) and to depths of 128 feet. It would be desirable to extend our offshore sampling, at least for spot checking to determine how far offshore this organism may occur during periods of non-red tide. The surface samples in all subareas still have the highest incidence of *G. breve*, 24.8 percent compared to 11.4 percent for the bottom water samples.

Concentrations of *G. breve* ranged from 0-200/l. The highest concentrations were again present in waters exceeding 18 feet. All stations showed a seasonal decline with the exception of Egmont Key south to Venice where a gradual increased incidence was noticed during March.

The low range in numbers follows the same pattern shown during other years (1955-1958) and probably represents the minimal population level of *G. breve*.

Large "butterfly" cells of *G. breve* were again present offshore.

INDUSTRIAL FISHES: Periodic sampling of the catches of trawlers operating out of Pascagoula, Miss., supplying pet food plants continued as the principal activity. Present data indicate that there is a much greater variance between vessels than within individual ones as to species composition. Therefore, in order to obtain reasonably accurate determination of species composition with the man hours available for this work, it was necessary to sample as many of the vessels landing fish as possible even at a slight sacrifice of sample size within individual loads due to the small sample size adopted. The average number of species per sample, the total number of boats landed, the number of boats sampled, and the percent of boats sampled from October 1958 through January 1959 is as follows:



Fig. 2 - Dumping fish into tanks at beginning of conveyor line at a Gulf of Mexico plant using industrial fish in canned pet food.

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	1958			1959
	Oct.	Nov.	Dec.	Jan.
Average number of species per sample ..	20	22	21	14
No. boats landing	155	118	129	95
No. boats sampled	10	22	23	40
Percentage of boats sampled	6.5	18.6	17.8	42.1

The species composition by weight and numbers of the industrial fish catch has been determined since October. The percentages by weight of the more important species from October to February 1958-1959 are:

Percentage of	1958			1959
	Oct.	Nov.	Dec.	Jan.
Croaker (<i>Micropogon undulatus</i>)	54.7	51.2	66.2	39.6
Spot (<i>Leiostomus xanthurus</i>)	3.0	9.1	9.8	23.0
Weakfish (<i>Cynoscion</i> sp.)	9.3	1.5	6.7	11.1
Miscellaneous	35.7	38.2	17.3	26.3



Maine Sardines

CANNED STOCKS, APRIL 1, 1959: Distributors' stocks of Maine sardines totaled 254,000 actual cases on April 1, 1959--39,000 cases or 13.0 percent less than the 293,000 cases on hand April 1, 1958, according to estimates made by the U. S. Bureau of the Census.

Canners' stocks on April 1, 1959, totaled 474,000 standard cases (100 $3\frac{3}{4}$ -oz. cans), about unchanged from the 476,000 cases on hand April 1, 1958.

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, April 1, 1959 with Comparisons								
Type	Unit	1958/59 Season			1957/58 Season			
		4/1/59	1/1/59	11/1/58	7/1/58	6/1/58	4/1/57	1/1/58
Distributors	1,000 Actual Cases	254	268	312	184	237	293	230
Canners	1,000 Standard Cases ^{1/}	474	891	1,037	386	235	476	1,111

^{1/}100 $3\frac{3}{4}$ -oz. cans equal one standard case.

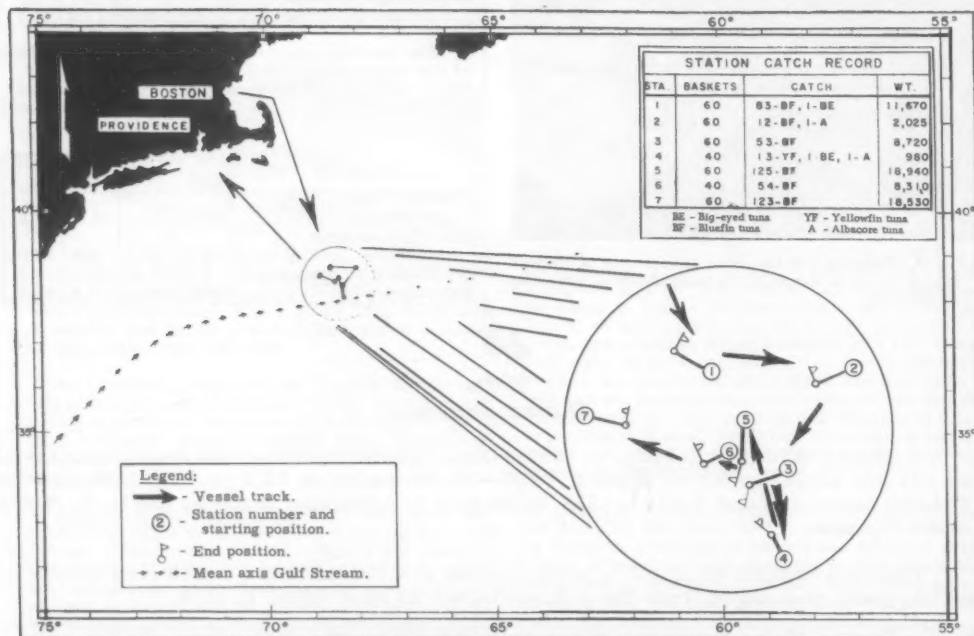
The 1958 pack from the season which opened on April 15, 1958, amounted to 2,021,000 standard cases as compared with 2,117,151 standard cases in 1957.

The supply as of April 1, 1959, totaled 2,434,000 standard cases, or 4.3 percent less than the total supply of 2,543,000 cases as of April 1, 1958. Shipments from April 15, 1958, to April 1, 1959, amounted to 1,960,000 standard cases as compared with 2,067,000 cases from April 15, 1957, to April 1, 1958.



North Atlantic Fisheries Exploration and Gear Research

GOOD CATCHES OF TUNA TAKEN ON EDGE OF GULF STREAM SOUTH-BY-EAST OF NANTUCKET (M/V Delaware Cruise 59-6): Commercial quantities of tuna were found to be readily available to long-line gear in an area on the edge of the Gulf Stream about 140 miles south-by-east of Nantucket, during a May 18-29 cruise of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. In seven fishing days, the vessel caught about 35 tons of tuna (mostly bluefin) on about two-thirds of the amount of gear which would be used on a commercial fishing trip.



M/V Delaware Cruise 59-6 (May 18-29, 1959).

The specific objective of the cruise was to explore for concentrations of tuna, in a limited area, along the north edge of the Gulf Stream approximately 140 miles south-by-east of Nantucket Lightship. The location was determined by analysis of data obtained during previous long-line fishing explorations by the Delaware.

Seven long-line sets were made during this cruise, and a total of 380 "baskets" of gear were fished. Each basket of gear was of standard 10-hook commercial type. At Stations 1, 3, 5, 6, and 7 (see chart), 33 tons of bluefin tuna (*Thunnus thynnus*) were caught in five days of fishing utilizing only 280 baskets of gear. This was a catch rate of 15.6 bluefin per 100 hooks. The surface temperatures at these stations ranged from 51° F. to 63.5° F.

The southernmost station (lat. $38^{\circ}06'$ N., long. $68^{\circ}16'$ W.), located near the axis of the Gulf Stream, yielded three species of tuna: yellowfin (*Thunnus albacares*), big-eyed (*Thunnus obesus*), and albacore (*Thunnus alalunga*). No bluefin tuna were taken at that station. The surface water temperature was 73° F.

No gear loss or significant damage was experienced during the cruise. Relatively few sharks were caught and only one tuna was shark-bitten. Notable was the absence of the white-tip shark (*Pterolamiops longimanus*) even in the warmer waters where yellowfin were taken. Previous cruises have shown that later in the season this species is one of the commonest sharks in the area.

The bluefin tuna averaged about 150 pounds; the size range was from 120-450 pounds. Yellowfin tuna taken at Station 4 ranged from 30-130 pounds each.

Bathythermograph casts were made at each station to determine subsurface temperatures. Evidence from the bathythermograph traces indicated the presence of a convergence of cool water with the warmer water of the Gulf Stream.

A total of 97 bluefin tuna were tagged with plastic dart tags and released. Tagging operations, in addition to other biological collections and oceanographic observations, were conducted in cooperation with the Woods Hole Oceanographic Institution.

At the conclusion of the cruise, 25 tons of tuna were unloaded and placed in storage at Providence, R. I.



North Pacific Exploratory Fishery Program

DEVICES TO IMPROVE OTTER-TRAWL PERFORMANCE TESTED (M/V John N. Cobb Cruise 42): Several recently-developed devices designed to provide data on otter-trawl performance and bottom conditions were tested during a three-week cruise (ended May 1, 1959) of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb. In addition, a cooperative tagging program was carried out with biologists of the Oregon Fish Commission.

The instrumentation studies included tests of a new electrical trawl cable designed to monitor and telemeter information from the fishing gear on the ocean floor to the bridge of the vessel. The cable, which has the dual purpose of operating as a standard trawl warp for fishing gear and for carrying electrical impulses, performed satisfactorily and no conductor breakages were noted during operations. Information telemetered through the cable included a measure of the depth at which the net is operating, the temperature of the water at the net, and information on the performance of the fishing gear. The latter information, which is monitored by a newly-designed "on-bottom-indicator," shows via a light on the bridge of the vessel when the trawl doors reach the bottom and whether or not the net is fishing on the ocean floor. When the doors are functioning properly, a light flashes

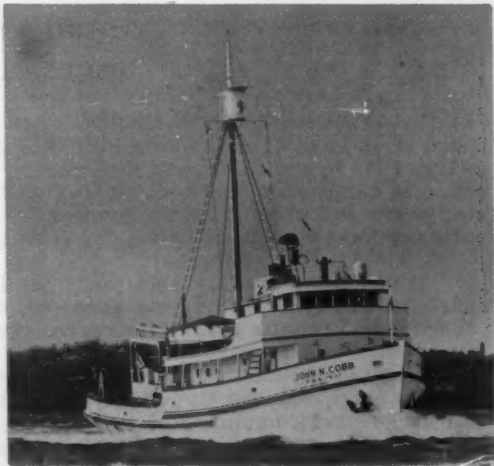
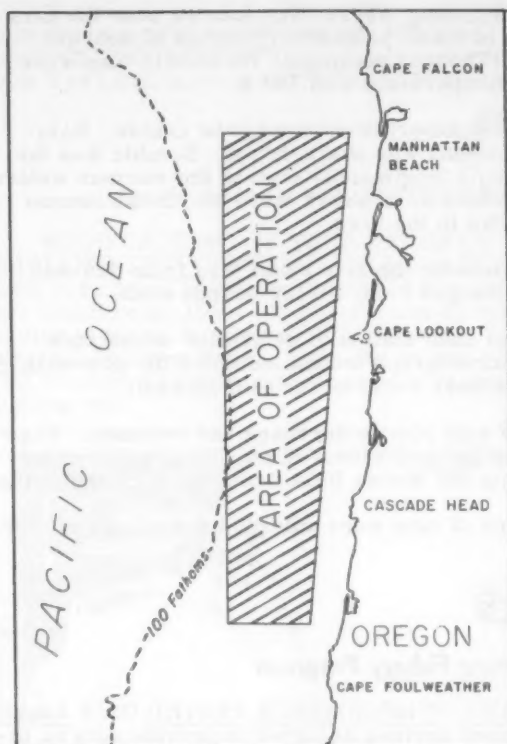


Fig. 1 - The Bureau's exploratory fishing vessel John N. Cobb.



M/V John N. Cobb, Cruise 42 (April 1959).

on in the pilothouse of the vessel. If the trawling speed is too fast or currents are encountered which alter the performance of the gear (causing it to lift from the bottom), then the circuit is broken and the light on the bridge goes off. This new device could be of considerable value to commercial trawlers and eliminate much of the guesswork from trawl fishing.

Another device perfected during the cruise was an automatic bottom sampler with a quick release device for easy attachment and removal from a trawl door. When the trawl door contacts the bottom the instrument scoops up a sample of the bottom and automatically closes and retracts. The device will allow fishermen or scientists to be accurately informed about bottom types in areas they fish.

A cooperative tagging program was conducted off the Oregon Coast in the vicinity of Manhattan Beach and Ocean Lake. A total of 5,102 tagged fish were released in two weeks of fishing. Of this total, 4,565 were English "sole" and 537 petrale "sole." Biologists from the Oregon Fish Commission hope that this tagging experiment will assist in determining the migrational habits of those species.



Salmon

CALIFORNIA PLANTS MARKED KING SALMON FINGERLINGS: The first phase of an investigation into the life history of the king salmon was completed late in May 1959 by the California Department of Fish and Game biologists. The investigation is designed to learn why the valuable sport and food fish has declined in recent years and what, if anything, can be done. It is hoped the project will ultimately point out ways of improving salmon fishing.

"It will be no overnight project," the Department's Director cautioned. "Because the life cycle of the king salmon is approximately four years, we cannot expect any real results from the first experiment until at least 1962."

The first experiment consisted of releasing one million tiny king salmon (2 to 3 inches long), bearing distinctive marks, at three places in the Sacramento River. This large-scale, complex operation began and ended in less than two months. Next year the number of marked fish released will be doubled.

Primary purpose of the first phase of the project is to measure differences in survival of fish released at various distances from the ocean. Effects of the differences will be measured as those fish appear in sport and commercial landings and on the spawning beds.

"While a more comprehensive project is planned for each of the next four years, practical problems arising from this year's work must first be solved if we are to succeed," the Director stated. He pointed out the results of this year's experiment were far different than the experience learned in a preliminary test the Department conducted in 1958.

"A few thousand fingerlings were transported last year from fresh to salt water in live-bait tanks aboard a boat and survival was nearly perfect, almost 100 percent," the Director reports.

"Using essentially the same technique and the same boat we found that survival this year ranged from 30 percent to 90 percent," he stated. "Our scientists have not yet pinned down the reasons for such a wide variation."

Another group of fish was trucked directly to the salt-water release site. Once there, salt water was pumped into the truck tank until fish were in water of the same salinity and temperature as that into which they were released. Six different lots received this treatment and their survival ranged from 10 percent to 40 percent.

On the other hand, survival of the two groups released at different places in fresh water has averaged about 90 percent.

Since quick transportation, with high survival, is essential to the success of the project, California biologists will continue experiments to try to solve the problem this year.

Personnel stationed at the U. S. Fish and Wildlife Service's Coleman Hatchery, located on Battle Creek near Redding, produced the fish and provided facilities for Department personnel to do the marking. In addition, the Federal agency trucked one-fourth of the marked fish to Hamilton City (near Chico) for release. Department personnel and trucks transported the remaining 750,000 marked fish to either Rio Vista or Tiburon (near Sausalito) for release.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JANUARY-MARCH 1959:

Oyster Research: All experimental oysters showed a moderate amount of growth during the first quarter of 1959, but considerably more than during the comparable period of 1958. Less than one percent died. Last year for the same period of time it was about five percent. This coincided with the extreme cold.

Seed oysters brought from Long Island in November grew at about a comparable rate as South Carolina seed. The New England seed suffered no greater mortality than young local oysters.

In February, a trunk was placed under the causeway between the two larger experimental ponds. This will allow the use of water from either pond for flushing the other pond when it is drained. A trial of this system in the latter part of March indicated its practicability, and it should be very helpful in controlling silting, one of the greatest problems connected with pond cultivation of oysters.

Shrimp Research: Experimental trawl hauls were made regularly throughout the quarter. The results have been tabulated, and compared with the catches made in 1958 and with the mean catch for a comparable time from 1953 through 1956. The cold winter of 1958--the coldest in 25 years--decreased the availability of the catch. This year shows a remarkable recovery. Croaker, shrimp, and crabs are

more abundant than before the freeze. If there is a cause-effect relationship between the availability of shrimp in this quarter with the catch the following fall, then this should be a good year for white shrimp. There is the possibility, however, that the excessive rains of this March (over 6 inches in 12 hours) will upset any favorable balance due to increased availability of shrimp this quarter.

Crab Research: Again this year biologists from the U. S. Bureau of Commercial Fisheries Laboratory at Beaufort, N. C., have joined forces with Bears Bluff Laboratory to tag mature blue crabs. Over 2,000 crabs were tagged in March. Approximately a third were tagged and released near the mouth of Five Fathom Creek, 25 miles north of Charleston. A third were released in the immediate vicinity of Charleston Harbor, and the remaining third were handled near the mouth of the North Edisto River. Fishermen are urged to return these tags to help increase knowledge about the movement of crabs. The tagging work last year indicated that although most of the crabs were caught near where they were tagged, some crabs moved a considerable distance. (Progress Report No. 39, January-March 1959, of the Bears Bluff Laboratories, Wadmalaw Island, S. C.)

Note: Also see Commercial Fisheries Review, February 1959, p. 32.



Spot

ABUNDANCE IN CHESAPEAKE BAY PREDICTED LOWER IN 1959: Although 1959 will probably be a poor year for catching spot (*Leiostomus xanthurus*) in great numbers, the chances of catching an oversized one are the best in many years, according to a marine biologist at the Virginia Fisheries Laboratory. Since 1955 Virginia biologists have been studying this species from its early development through the nursery areas and into the commercial fishery.

The sport and commercial fishery for spot is generally supported by two-year old or younger fish. From their abundance in monthly trawl surveys and from scale readings to determine the ages of fish in the commercial catch, the biologists here found that spot hatched in the winter of 1955/56 met with unusual success, and unusually great numbers were present in the Bay the following spring and summer. Many large spot appeared in the fishery in 1958, survivors of that successful spawning.

"It is unusual to find spot past three years old in the commercial catch," the biologist stated, "but because of the high abundance of young fish in 1956 a larger than usual number should appear this summer, so that fishermen have the best opportunity in years of catching a fish of record size. Because the abundance of young spot decreased in 1957 and 1958, not as many will be available to fishermen this summer as last year. Seventeen times as many small spot were taken in samples collected by the Laboratory biologists in 1956 as in 1957, and three times as many as were present in 1958."

The biologists estimate that not more than 15 percent of all of the spot present in Chesapeake Bay and its rivers are caught annually by commercial and sport fishermen, and that approximately 60 percent die from predation, disease, and other natural causes, or leave the Bay. This indicates that the number of fish taken by the fishery has a relatively small effect on catches in subsequent years. "When natural conditions favor the larval and young fish, there are plenty for all fishermen," the biologist stated.

Spot make a very rapid growth during their first two years. At the end of the first summer they average about 5 inches, though some may be as much as 7 inches long, but by the end of the second summer they average nearly 9 inches, and weigh

about a half pound. That little or no growth occurs during the winter months has been proved by sampling the winter trawl fishery.

Biologists at the Virginia Fisheries Laboratory are confident that through their sampling devices they can give fishermen an accurate prediction of the relative abundance of spot at least a year in advance.



Standards

PROPOSED STANDARDS FOR FROZEN COD FILLETS AND BREADED PORTIONS REVIEWED AT MEETINGS: United States Standards for Grades of (1) Frozen Cod Fillets and (2) Frozen Raw Breaded Portions--prepared by the U. S. Bureau of Commercial Fisheries after careful consideration of all data and views submitted by individual members of industry, trade associations, and from other sources--were the subject of further review at a series of public meetings held between June 9-15, 1959.

These standards are designed to serve as a convenient basis for sale in wholesale transactions, for establishing quality-control programs, and for determining loan values on stocks. They will also enable inspection and grading of these commodities by the Federal inspection service of the Bureau, which service is available for the inspection of other processed fish products as well.

It is the policy of the Bureau to build standards of quality that (1) will accurately represent differences in market value; (2) will bring about a uniform quality description in simple, easily understood terms upon which satisfactory trading can be effected; and (3) may be useful in establishing quality-control programs.

The proposed standards for frozen cod fillets and frozen raw breaded portions were reviewed at public meetings in Boston on June 9, 1959, in Chicago, June 11, 1959, and in Seattle on June 15, 1959. Following the final review of the proposed standards for frozen cod fillets and frozen raw breaded portions, taking into consideration the comments received, the standards will be published in the Federal Register.

Packers, brokers, distributors, users, and other interested parties were invited to attend the meetings or send in comments on the proposed standards.



Transportation

EXEMPT TRUCKING OF FRESH AND FROZEN FISHERY PRODUCTS UNDER STUDY: A study of "exempt trucking" of fresh and frozen fish and shellfish is being made by the U. S. Bureau of Commercial Fisheries. The firm awarded the contract to make the study will interview about 350 shippers and 200 carriers of fresh and frozen fishery products in 28 states covering all producing areas of the country.



Little is known about the transportation of fresh and frozen fishery products. Motor carriers are not subject to economic regulation by the I. C. C. when trans-

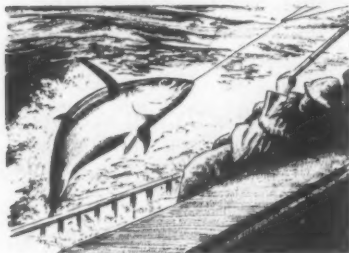
porting these products. Therefore, there is no reporting of movement of such items as to number of vehicles and tons carried, nor is there a requirement to publish rates and adhere to specific routes. This exemption from regulation is based on the fact that those fishery products are perishable and production is seasonal and cannot be scheduled. These requirements preclude their movement by firmly established routes or on established schedules.

The objective of the study is to ascertain the significance of "exempt truck" transportation to fresh and frozen fish and shellfish producers, dealers, and processors. The study will be mainly concerned with the value of the service rendered by the exempt truckers as compared with the regulated service.



Tuna

CALIFORNIA CAPTAIN FISHING OUT OF PUERTO RICO REPORTS TUNA PLENTIFUL IN EASTERN ATLANTIC: A San Diego tuna vessel captain fishing out of Ponce, Puerto Rico, says that tuna are plentiful in Eastern Atlantic. The captain returned to San Diego in April for a visit after making a pioneering voyage to African waters on the 148-foot clipper *Chicken of the Sea*. The vessel is owned by a California fish cannery and is 1 of 8 former California clippers now fishing for the company's cannery in Ponce, Puerto Rico. The San Diego captain is on his second voyage to west African waters, together with one or two other boats from the same company.



He said that the vessel's 17-man crew caught 450 tons of tuna in 14 days of fishing. Most of the 110-day trip, he said, was spent making courtesy calls on government officials in ports along the

west coast of Africa in preparation for more visits by the company's clippers.

"We saw tuna every day from the time we left Puerto Rico till we reached the African coast," he said. He reported that there was plenty of herring to be had for bait near the African coast.

Most of the catch was made about 100 miles south of Dakar and about 120 miles offshore.

At times, he reported, the crew poled yellowfin tuna as fast as they could pull them in. The fish weighed from 40 to 60 pounds each.

Now fishing out of Ponce are the clippers *American Beauty*, *Western Ace*, *Western King*, *American Queen*, *Espiritu Santo*, *Corsair*, and *Beverly Lyn*, all formerly of San Diego.



United States Fishing Fleet¹/Additions

MARCH 1959: A total of 29 vessels of 5 net tons and over were issued first documents as fishing craft during March 1959--24 less than in March 1958. The Gulf area led all other areas with 9 vessels, followed by the Chesapeake with 8 vessels, the South Atlantic with 6, and the New England and Middle Atlantic areas with 3 each.

¹/Includes both commercial and sport fishing craft.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft, by Areas, March 1959

Area	March		Jan.-Mar.		Total
	1959	1958	1959	1958	1958
	(Number)				
New England	3	1	5	3	13
Middle Atlantic	3	-	3	3	13
Chesapeake	8	7	21	24	99
South Atlantic	6	9	18	32	135
Gulf	9	27	25	62	270
Pacific	-	6	8	19	112
Great Lakes	-	-	3	2	10
Alaska	-	3	2	3	31
Virgin Islands	-	-	-	1	1
Total	29	53	85	149	684

Note: Vessels assigned to the various sections on the basis of their home ports.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft, by Tonnage, March 1959

Net Tons	Number
5 to 9 . . .	11
10 to 19 . . .	8
20 to 29 . . .	3
30 to 39 . . .	5
40 to 49 . . .	1
180 to 189 . . .	1
Total	29

From January-March 1959, a total of 85 vessels were documented as fishing craft, a decline of 64

vessels as compared with the first three months of 1958. Most of this decline occurred in the Gulf area with 37 vessels documented as compared with the 1958 three-months period.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, FEBRUARY 1959: Imports of edible fresh, frozen, and processed fish and shellfish into the United States during February 1959 decreased by 17.5 percent in quantity and 14.1 percent in value as compared with January 1959. The decrease was due primarily

United States Foreign Trade in Edible Fishery Products, February 1959 with Comparisons

Item	Quantity		Value	
	Feb. 1959	Year 1958	Feb. 1959	Year 1958
	(Millions of Lbs.)		(Millions of \$)	
Imports:				
Fish & shellfish:				
Fresh, frozen, & processed ^{1/} . . .	72.5	62.3	956.8	21.3
Exports:				
Fish & shellfish:				
Processed only ^{1/} (excluding fresh and frozen) . . .	3.3	2.8	41.2	1.0
			0.8	15.6

^{1/}Includes pastes, sauces, clam chowder, and juice, and other specialties.

to lower imports of groundfish fillets (down 10.6 million pounds) and canned tuna in brine (down 1.7 million pounds), and to a lesser degree, a decrease in the imports of shrimp and frozen tuna other than albacore. These decreases were partly offset by a 2.7-million-pound increase in the imports of fillets other than groundfish and frozen albacore tuna (up 3.6 million pounds).

Compared with February 1958, the imports in February 1959 were up by 16.9 percent in quantity and 16.4 percent in value due to higher imports of frozen albacore and other tuna (up 12.0 million pounds), and frozen shrimp (up 3.0 million pounds). Compensating, in part, for the increases was a drop of about 3.6 million pounds in the imports of groundfish and other fillets.

United States exports of processed fish and shellfish in February 1959 increased by 38.2 percent in quantity and 25.0 percent in value as compared with January 1959. Compared with the same month in 1958, the exports in February 1959 were higher by 19.8 percent in quantity and unchanged in value. The exports this February as compared with the same month in 1958 were up due to increased exports of California sardines.

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EDIBLE FISHERY PRODUCTS, MARCH 1959: Imports of edible fresh, frozen, and processed fish and shellfish into the United States during March 1959 increased by 12.1 percent in quantity and 21.3 percent in value as compared with February 1959. The increase was due primarily to higher imports of groundfish fillets (up 2.2 million pounds) and canned salmon (up 3.6 million pounds), and to a lesser degree, an increase in the imports of frozen shrimp, canned sardines, and fresh and frozen salmon. These increases were partly offset by a 1.2-million-pound decrease in the imports of frozen albacore tuna.

Compared with March 1958, the imports in March 1959 were up by 22.8 percent in quantity and 10.5 percent in value due to higher imports of groundfish fillets (up 1.3 million pounds), frozen tuna including albacore (up 12.0 million pounds), and frozen shrimp (up 3.5 million pounds). Compensating, in part, for the increases was a drop of about 0.6 million pounds in the imports of canned tuna and frozen spiny lobsters (down 0.7 million pounds).

United States Foreign Trade in Edible Fishery Products, March 1959 with Comparisons

Item	Quantity		Value	
	March 1959	Year 1958	March 1959	Year 1958
	(Millions of Lbs.)		(Millions of \$)	
Imports:				
Fish & shellfish:				
Fresh, frozen, & processed ^{1/} . . .	84.1	68.5	956.8	24.3
Exports:				
Fish & shellfish:				
Processed only ^{1/} (excluding fresh and frozen) . . .	7.7	2.1	41.2	2.1
			0.6	15.6

^{1/}Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in March 1959 were up 131.9 percent in quantity and 110.0 percent in value as compared with February 1959. Compared with the same month in 1958, the exports in March 1959 were higher by 260.3 percent in quantity and 250.0

percent in value. The exports this March as compared with the same month in 1958 increased due to the better stocks of California sardines available for export to foreign markets.

GROUNDFISH FILLET IMPORTS, APRIL 1959: During April 1959, U. S. imports of groundfish and ocean perch fillets and blocks amounted to 19.1 million pounds--an increase of 4.8 million pounds (33 percent) as compared with the corresponding month of last year.

Iceland was the leading shipper with 7.6 million pounds--a gain of 3.1 million pounds compared with April 1958. Canada was second with 5.8 million pounds--1.3 million pounds below the same month of last year. Denmark followed with 3.7 million pounds (up 1.7 million pounds), and Norway with 1.1 million pounds compared with only 4,000 pounds in April of 1958.

During the first four months of 1959, imports of cod, haddock, hake, pollock, cusk, and ocean perch fillets, including blocks, amounted to 60.6 million pounds. Compared with the same period of last year, this was a gain of 14.4 million pounds or 31 percent. Canada (22.8 million pounds) supplied 38 percent of the 1959 four-months total; Iceland 34 percent (20.8 million pounds); Norway and Denmark each 12 percent. The remaining 4 percent was supplied by West Germany, Miquelon and St. Pierre, the Netherlands, the United Kingdom, and Ireland.

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA: The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1959 at the 12½-percent rate of duty is 52,372,574 pounds. Any imports in excess



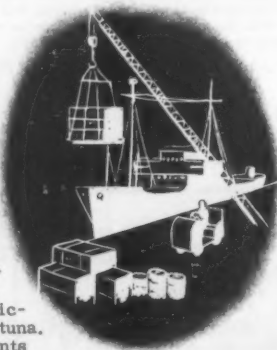
of the quota will be dutiable at 25 percent ad valorem.

Imports January 1-May 2, 1959, amounted to 14,958,862 pounds, according to data compiled by the U. S. Bureau of Customs. During January 1-May 3, 1958, a total of 12,490,111 pounds had been imported. The quota for 1958 of 44,693,874 pounds was reached on November 20, 1958.

IMPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-MARCH 1959: First quarter trends showed further gains in United States imports of groundfish and ocean-perch fillets, tuna, shrimp, scallops, and fish meal.

Groundfish and Ocean-Perch Fillets and Blocks: Imports during the first quarter of 1959 were 19 percent above the same quarter of 1958. Canadian shipments of groundfish were lower this year, but Icelandic, Norwegian, and Danish shipments were higher.

Tuna, Fresh or Frozen: Imports during the first quarter of 1959 continued at a high level. Albacore imports were up 29 percent over the same 1958 period; other tuna, mainly yellowfin and big-eyed, were up 129 percent. Japan, by far the leading source, shipped both Atlantic- and Pacific-caught tuna. In addition, shipments from Peru during the first quarter of 1959 were nearly four times those of the comparable 1958 quarter.



Tuna, Canned in Brine: Imports for the first three months of 1959 were 32 percent higher than in the same period of 1958. The 1959 quota of canned tuna in brine which may enter the United States at the 12½-percent rate of duty was fixed at 52,372,574 pounds.

Shrimp, Mostly Frozen: Imports continued their upward trend. Receipts from abroad were 60 percent above those of the first quarter of 1958. Mexico was the leading source, shipping 55 percent of the total. Japan, with an impressive gain, followed Panama in quantity of shrimp supplied.

Lobster, Fresh, or Frozen: In the first quarter of 1959, lobster imports from Canada were 35 percent less than in the first quarter of 1958; spiny-lobster imports from other countries were 11 percent greater. Increased spiny-lobster imports from Australia and New Zealand offset decreased imports from the Union of South Africa.

Sea Scallops, Fresh or Frozen: Imports for the first three months of 1959 were double those of the same period of 1958. More than two-thirds of the increase was the result of higher receipts from Japan.

Canned Sardines: With increased shipments from Norway and Portugal, imports of canned in oil for January to March 1959 were 29 percent above those of January to March 1958. Because of greater domestic supplies of canned California sardines not in oil, first quarter imports of that product were much below imports for the first quarter of 1958.

Canned Salmon: During the first quarter of 1959, imports were up 8 percent over the same period of 1958. Japan's share of this trade rose to 94 percent; Canada's share fell to 6 percent.

Canned Crabmeat: January to March 1959 imports were 39 percent above those of the similar period in 1958. Japan supplied almost the entire amount.

Oysters (Mostly Canned): Imports during the first quarter of 1959 were 60 percent above those during the similar period of 1958. As with canned crabmeat, nearly all came from Japan.

Fish Meal: Imports during the first quarter were more than double those of the first quarter of 1958. Receipts from Peru continued at an increased rate thereby making that country the leading foreign source of this product, as it was in 1958. During the first three months of 1959 receipts from Angola and Canada were about twice those of the same period of 1958.

EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-MARCH 1959: Canned Sardines, Not in Oil: Exports for the first quarter of 1959 were a-

bout four times those of the same period of 1958. Due to the improved pilchard catch in the 1958 season, larger supplies of canned California sardines were available for export.

Canned Mackerel and Anchovies: Reduced supplies of these products resulted in lower exports as compared with the same 1958 period, and much lower compared with the same 1957 period.

Canned Salmon: During the first three months of 1959, canned salmon exports were nearly nine times those of the like period of 1958. The primary reason for the increase was exceptionally large shipments (2,131,579 pounds) to the Philippines in March 1959.

Canned Squid: During the first three months of 1959, exports were 74 percent below those of the comparable period of 1958. The Philippines, which has been the main market for this product, imported larger amounts.

Fish Oils, Inedible: Primarily as a result of lower sales to the three leading markets--West Germany, the Netherlands, and Canada--exports of fish oils during the first quarter of 1959 were 29 percent below those of the same period of 1958.

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VALUE OF FISHING TACKLE IMPORTS HIGHEST ON RECORD: United States imports of sport fishing tackle, equipment, and parts in 1958 amounted to \$6,853,403 for an all-time high. This amount represents an 11.5-percent increase over 1957 imports and more than a fourfold increase over 1950, according to the Consumer Durable Goods Division, U. S. Department of Commerce.

Reel imports, which numbered 1,504,453, valued at \$3,593,288, accounted for more than half of the value of all tackle imports. Although 1,070,190 reels from Japan, valued at \$1,067,466, far exceeded imports from any other country numerically, the value of reels from France exceeded those

from Japan by about 47 percent. Imports of French reels in 1958 numbered 294,488 and were valued at \$1,566,334. Japanese reels averaged 99 cents each and French reels \$5.32; however, reels from Western Germany topped the average price of all at \$8.11 each. U.S. imports of West German reels numbered 22,862, and were valued at \$185,431.

Two other classes of imports exceeded \$1 million each and with the reels accounted for almost 90 percent of the year's imports: hooks, other than snelled, \$1,117,269; and the "basket" class including snelled hooks, artificial baits and flies, and fly boxes, \$1,300,825.



Wholesale Prices, May 1959

Wholesale prices from April to May this year showed no significant change over-all, but they were somewhat lower than a year earlier. Prices for fresh salt-water fish were higher in most instances, while processed frozen fishery products prices were lower. Demand was good, but catches were unusually light for this time of year. The May 1959 edible fish and shellfish (fresh, frozen, and canned) wholesale price index (121.7 percent of the 1947-49 average) was only 0.8 percent less than the previous month and 5.4 percent lower than in the same month of 1958.

With lower landings of salt-water fish, especially in the New England area, prices for certain fresh processed fish and shellfish products, like haddock fillets, in May rose above those reported in April, but most prices were lower than a year earlier. On the other hand, fresh-water fish prices in May were lower than in April, when higher prices prevailed because of the Jewish holidays. Since there was a very substantial drop in the landings of haddock at Boston, prices for fresh large drawn haddock rose (27.6 percent) in May, but they were lower (4.6 percent) than for the same month of 1958. With the arrival of fresh halibut on the market in May, prices for that fish were higher (4.8 percent) than in April and just slightly higher than in 1958. Salmon landings continued light in May and prices rose (1.6 percent) above April, but they were significantly lower (3.2 percent) than in the same month of 1958. The May 1959 wholesale price index for the drawn, dressed, and whole finfish subgroup rose 2.5 percent over the

previous month, but was 1.9 percent lower than for the same month of 1958.

Among the fresh processed fish, small haddock fillets reflected the lower haddock landings in New England with prices in May 21.0 percent higher than in April, but 4.2 per-



cent lower than in May 1958. Some improvement in shrimp landings and a slight decrease in demand caused the shrimp prices in May to drop slightly below those in April and dropped 6.9 percent below May 1958. There was almost no change in the fresh processed fish and shellfish subgroup index from April to May this year, but it was 4.4 percent lower than in the same month of 1958.

Improvements in stocks and increased imports of frozen processed fishery products were the causes attributed to the

general drop in prices from April to May, and those prices were also lower than in May 1958. Frozen haddock fillet prices dropped (7.0 percent) from April to May and they were also lower (2.9 percent) than in the same period of 1958. Frozen shrimp prices at Chicago in May were lower (8.2 percent) than in April and 16 percent lower than in May 1958 when prices had reached a rather high level. From April to May 1958, the wholesale price index for processed frozen fish and shellfish dropped 6.4 percent and was 10.7 percent lower than in the same period of 1958.

From April to May there were only slight changes in the prices for canned fishery products, but compared with a year earlier the price changes were more significant. Canned salmon prices were fairly steady with indications that canned

pink salmon prices might strengthen in June. With substantial stocks and in spite of the tuna fleet tie-up on the West Coast, canned tuna prices dropped 1.8 percent from April to May and were 7.3 percent lower than in the same period of 1958. California sardine and Maine sardine prices rose in May. Export sales of California sardines picked up, while the new season for Maine sardines which opened on April 15 had not yet really started because early season landings in Maine were light. Compared to May 1958, when the available stocks were very light, California sardine prices this May were 36.6 percent lower. On the other hand, Maine sardine prices this May were 11.3 percent higher than in May 1958 because of light stocks and a good demand. The over-all canned fishery products subgroup index in May 1958 was 5.5 percent lower than in the same month a year earlier.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, May 1959 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1947-49=100)			
			May 1959	Apr. 1959	May 1959	Apr. 1959	Mar. 1959	May 1958
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121.7	122.7	128.2	128.6
Fresh & Frozen Fishery Products:					138.1	139.6	148.8	146.0
Drawn, Dressed, or Whole Finfish:					145.5	141.9	153.6	148.3
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.08	97.0	76.0	149.2	101.7
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.35	.33	107.0	102.1	103.1	106.7
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.78	.76	174.1	171.3	168.5	179.8
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.78	.98	192.1	241.7	166.1	190.9
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.95	1.08	192.1	217.4	161.8	202.2
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.60	.71	140.7	166.5	170.0	111.4
Processed Fresh (Fish & Shellfish):					136.4	136.5	145.8	142.7
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.35	.29	117.4	97.0	161.6	122.5
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.86	.87	136.7	137.4	143.8	150.1
Oysters, shucked, standards	Norfolk	gal.	5.63	5.75	139.2	142.3	145.4	136.1
Processed, Frozen (Fish & Shellfish):					119.8	128.3	133.9	134.1
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.40	100.8	103.4	106.0	103.4
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.33	.36	103.6	111.4	124.0	106.7
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.30	112.8	118.8	118.8	118.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.76	.83	117.6	128.1	132.3	140.0
Canned Fishery Products:					98.6	99.0	98.8	104.3
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.50	22.50	117.4	117.4	116.1	120.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.80	11.00	77.9	79.3	79.3	84.0
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.15	7.00	83.9	82.2	86.9	132.4
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.35	8.22	88.8	87.5	87.5	79.8

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.





International

FOOD AND AGRICULTURE ORGANIZATION

USE OF ATOMIC BYPRODUCTS IN PRESERVING FOODS:

Studies on the treatment of some foodstuffs with relatively low dosages of ionizing radiations have advanced in Europe to a point where some practical applications of the method may be developed in the reasonably near future provided that the wholesomeness of the treated food has been assured.

A report completed by the Food and Agriculture Organization (FAO) says, in guarded and qualified language, that impressive progress has been made in the past few years in laboratory use of radiations in extending the storage life of foods and in killing undesirable organisms in food.

The report is a summary of the European meeting on the use of ionizing radiations for food preservation, held in November 1958 at the United Kingdom Atomic Energy Authority's Atomic Energy Research Establishment at Harwell. It was attended by 176 representatives of 17 European members of FAO, and by 22 observers from five non-European members, and 14 international organizations.

On the basis of review papers presented by invited specialists from European countries and the United States, the meeting surveyed the present status of food irradiation, evaluated the technique's potential for European countries, and considered the need for and possibilities of organizing international cooperation in research.

The report warns that many basic problems remain to be solved before radiation treatment of foods for the extension of their storage life will be ready for widespread development and application. But, it points out, "a few possible applications of irradiation, such as the inactivation of *Salmonella* in egg products and of certain parasites in meat, the disinfection of grain and certain packaged products, and the suppression of sprouting in potatoes and root crops, are approaching the stage at which commercial exploitation might be considered, provided that the wholesomeness of the treated foods had been assured."

Food irradiation was still in the stage of laboratory research in Europe but plans under way in the United States for pilot and demonstration plants "reflect confidence in the process."

Present indications were that treatments involving the use of substerilizing doses of radiation, rather than the higher sterilizing doses, were "more likely to lead to practical applications in the reasonably near future."

Treatment with moderate doses had produced a five-fold increase in the storage life of certain meats and meat products, fish, and some fruits and vegetables. The food poisoning organism *Salmonella*, frequently found in egg products, had been successfully killed in frozen whole egg pulp. The irradiation process, the report says, performs its work without appreciably raising the temperature and thereby cooking foods, and the product need not be removed from its package.

Treatment with higher doses, intended to give a sterile food in which no microbial spoilage is possible, produced changes in color, flavor, odor, and texture which were considered objectionable. This problem would have

to be solved before such treatments were likely to be used on a wide scale.

The meeting agreed that the potential value of food irradiation as a method of preservation "justified considerable investment in research." It recommended that European governments encourage and support such research, and that appropriate forms of international cooperation in this research be established to reduce its cost. It asked that FAO establish a permanent technical working group on food irradiation to review developments in the field, and that the Organization set up such other technical groups as will be necessary to study the problem of formulating fundamental principles governing the use of irradiation and methods of testing irradiated foods for wholesomeness; the aim would be to evolve a common basis for legislation on the subject in individual countries, other such technical groups might be formed to study microbiological and entomological aspects of food irradiation.

* * * * *

INTERNATIONAL STANDARDS FOR CHEMICAL ADDITIVES TO FOOD PROPOSED:

A joint committee of the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) has made a move towards identifying and establishing standards of purity on an international basis for commonly-used chemicals which are added to many foods.

The Joint FAO/WHO Expert Committee on Food Additives which met in Rome in December has begun to draw up provisional specifications for a number of the more important food additives, with special reference to antimicrobial preservatives (used in fruit juices, jams, etc.) and antioxidants (used for stabilization of fats and oils). Earlier meetings of the joint committee had agreed that food additives should be identifiable, and that established specifications of purity were the best means of excluding harmful impurities from food additives.

At the December meeting, delegates stated that specifications or standards of purity have been established for only a small portion of the increasing number of chemical substances which are currently added to the world's food supply.

International (Contd.):

Substances added to foods, it was pointed out, are used for a variety of purposes, among them the preservation, flavoring, and coloration of foodstuffs. The joint meeting said that the identity and concentration of major components of a food additive must be known in order to carry out an effective investigation of its properties. It drew up provisional specifications for two major groups of the most commonly-used food additives, that is the antimicrobials and the antioxidants. These specifications include the chemical name and popular synonym of each substance, its description and chemical or structural formula, the percentage of each component, proposed identification tests, and acceptable standards of purity.

* * * * *

IMPROVED MIDWATER TRAWLING
METHOD DEMONSTRATED:

Promising catches of herring and sprat have been made with a new type of one-boat midwater trawl gear, consisting of a high opening nylon net, hydrofoil otter boards, and an echo-sounder oscillator attached to the headline of the net for continuous trawl depth indication and fish detection.

This method has been perfected by a gear technologist on the staff of the Fisheries Division of the Food and Agriculture Organization (FAO), Rome. It is based on experimental work carried out by him when a member of the Institut für Netz- und Materialforschung, Hamburg.

The technologist was loaned by FAO to the Institute in December 1958 to carry out midwater trawling experiments with a typical German North Sea cutter. These boats are about 24 meters (79 feet) over-all, powered with 150 hp. engines. When trawling in midwater the cutters usually work in pairs, two boats towing one net between them. In Germany there is also a rather primitive one-boat method using conventional otter boards which are kept at the desired depth by attaching them to big surface floats. The experiments were concentrated on improving the one-boat trawl.

The main problem in midwater trawling has been to tow the net at the proper depth to catch the fish, and control the net so that it can be quickly raised or lowered as desired. The shorter the warps and the higher the towing speed, the higher the net will travel through the water. But this general rule applies only to a small degree to the one-boat trawl where the depth of the net has to be adjusted by changing the length of the strops connecting the otter boards with the surface. Furthermore, accurate adjustment of the net to the actual depth of the fish requires continuous indication of the depth of the net, so that the proper action can be taken in time.

The basic idea of the improved method is not new. It consists of attaching an oscillator (transducer) to the net and connecting it by cable to the echo-sounding unit installed on board.

An echo-sounder oscillator attached to the bottom part of the headline to sound downwards indicates not only the depth of the net but also the position of the foot-rope and the fish in the net-opening and below the net, as well as the sea bottom.

This enables the fisherman to know the depth of the net, check if the gear is operating properly, and to see if the fish in the path of the net are really caught. With some experience, he should be able to estimate the rate of catch and so determine the right time for hauling. These very obvious ad-

vantages make it much easier to accept the slight trouble of handling an extra cable.

The experimental net had an opening height of 8 to 10 meters (26-33 feet) and, to improve its maneuverability, hydrofoil otter boards, designed by F. Suberkrub, Hamburg, were used. These provide a good sheer at a considerably lower drag as compared with the conventional boards. The warp is attached above the center of the board which gives an inward tilt, the lift varying with the towing speed. This increases considerably the influence of speed variations on the depth of the net, and enables the captain to regulate the depth through engine control.

This new gear combination enables the captain to practice "aimed" fishing in what has hitherto been mostly a blind operation.

The captain of the cutter chartered for the experiments was soon able to handle the gear and, since the experiments, has successfully fished with it on a commercial scale. He has often caught the same amount, or even more, than have the pair-trawl boats fishing nearby.

German deep-sea trawler companies are very interested in midwater trawling for herring, particularly as an additional method for craft of 400 to 500 British registered tons and 600 to 800 hp., which are not suitable for fishing on the distant grounds off Greenland, Newfoundland, and Labrador.

Considering the promising results of the cutter experiment, it was advisable to test this type of gear with a medium-sized deep-sea trawler, too. The experiments were carried out with a steam trawler of 4,000 BRT and 600 hp. in the northern North Sea during February 1959. A very big and light nylon trawl was made which worked with an opening height of 12 to 14 meters (39-46 feet). Basically the same echo-sounder oscillator arrangement was used but with an automatic electric winch, which was essential for handling the 400-fathom cable needed for fishing at about 110 fathoms.

The method proved to be applicable for these bigger craft and valuable experience was gained for future improvements. Catches of up to 3 1/2 tons of herring per haul were made, which were considered fairly good in view of the limited size and density of the schools present.

An interesting innovation was tested during these trials, that of an oscillator on the trawl headline transmitting concurrently up to the surface and down to the bottom. This gives the captain much better information on the actual trawl depth. Irregularities of the bottom profile may be mistaken for net movements and vice versa but the indication of the trawl's distance from the surface eliminates this difficulty completely.

The result of these experiments, financed by the German Ministry of Agriculture on request of the German fishing industry, is a big step forward in improving the technique of commercial midwater trawling.

It is likely that this method of "aimed" trawling may lead to exploiting pelagic fish resources which have not been, or only to a limited extent, fished so far.

GENERAL AGREEMENT
ON TARIFFS AND TRADEFOURTEENTH SESSION OF
THE CONTRACTING PARTIES:

Important issues of international trade policy confronted the thirty-seven countries that are signatory to the General Agreement on Tariffs and Trade (GATT) when they convened in Geneva on May 11, 1959, for their 14th General Session.

International (Contd.):

Among the major issues requiring action is the United States proposal that the Contracting Parties undertake another general round of tariff negotiations in 1960.

The steady improvement in Western Europe's payments position in recent years has raised certain issues for the Contracting Parties. The GATT specifies that with certain exceptions quantitative restrictions should be used to curtail imports only when required to safeguard a country's foreign exchange reserves by bringing payments back into balance with receipts.

A third intersessional committee charged with responsibility for recommending ways to expand international trade with particular reference to the exports of less-developed countries, will submit its work program to the Contracting Parties.

The request of Yugoslavia to participate in the work of the Contracting Parties on an associate basis will also come up at the 14th Session. While not prepared to assume the full obligations of a contracting party to the GATT, the Yugoslavs would like to bring their trade and their commercial procedures more closely in line with those of the other GATT signatories, and are seeking to do so through a form of associate participation.

In addition, the Session will deal with a number of other matters including actions taken by certain Latin American countries to supplement their effective tariff rates by the imposition of surcharges, the application of Israel for accession to the GATT, further consideration of the impact of the overseas territories provisions of the Rome Treaty on the trade of third countries, a number of complaints by governments against specific actions taken by other governments, and various proposals for improving procedures.

NORTHWEST ATLANTIC FISHERIES COMMISSION

ANNUAL MEETING IN MONTREAL:

The Ninth Annual Meeting of the International Commission for the Northwest

Atlantic Fisheries was held in Montreal, Canada, in the week beginning June 1, 1959. From May 26-30, the Standing Committee on Research and Statistics and the Groups of Scientific Advisers to Panels 3, 4, and 5 met. In order to facilitate the work of the various research groups several ad-hoc committees and the chairmen were appointed in advance to make preparations for the formal meetings.

Commissioners, advisers, and experts from the 12 member countries participated in the meeting. The Commission invited the following to send observers: The Food and Agriculture Organization; International Council for the Exploration of the Sea; International Fisheries Convention 1946; International North Pacific Fisheries Commission; International Pacific Halibut Commission; International Pacific Salmon Fisheries Commission; Great Lakes Fisheries Commission; Poland; and World Meteorological Organization.

* * * * *

MORE COUNTRIES TO FISH ON NORTHWEST ATLANTIC FISHING GROUNDS:

The Polish fishing industry, which has been expanding rapidly during recent years,



expects to extend its activities to the Northwest Atlantic area this coming summer. Due to the extension of fishing to the banks off eastern North America, Poland has become interested in

the work of the International Commission for the Northwest Atlantic Fisheries. The Commission has invited Poland to send observers to the Commission's 1959 annual meeting.

The Belgians are looking for new fishing grounds since the extension of Iceland's territorial waters to 12 miles. Recently a Belgium fishing firm sent two trawlers to test the fishing grounds off Labrador. The vessels found the grounds so rich in ocean perch stocks that capacity loads of 250 metric tons were taken in seven days.

International (Contd.):

The two trawlers are new and large enough to permit fishing trips of up to 30 days. They are fully equipped to permit filleting, freezing, and salting of the catch as well as the manufacture of fish meal. The Belgium firm plans to send smaller trawlers from its fleet to the Banks off Labrador and Newfoundland and to the Gulf of St. Lawrence as a result of the successful initial trips of the two large vessels.

Brazil has acquired three large trawlers intended for fishing on banks off the United States and Canada. A special port with processing facilities has been established to handle the catches of these vessels. This is a new venture for Brazil which has in the past imported its salt cod.

In addition to the above, Cuba has started to fish for cod in the Northwest Atlantic.

PROTOCOL AMENDING CONVENTION ENTERS INTO FORCE:

The protocol (dated at Washington June 25, 1956) between the United States of America and other countries, amending the International Northwest Atlantic Fisheries Convention of February 8, 1949, entered into force on January 10, 1959.

NORTHWEST PACIFIC FISHERIES COMMISSION

JAPANESE NORTH PACIFIC SALMON MOTHERSHIP QUOTA FOR 1959:

The third annual meeting of the Japanese-Soviet Commission for Northwest Pacific Fisheries came to an end on May 13, the 122nd day since negotiations began, with acceptance by Japan of a salmon catch quota in the treaty area of 85,000 metric tons. Despite Japan's initial request for a 165,000-ton quota, on the grounds that 1959 is a peak year in pink salmon abundance, she finally accepted, in the face of unyielding Soviet insistence that the salmon resources of the Far East are declining under the pressure of the Japanese fishery, a quota considerably below last year's 110,000 tons and the 1957 quota of 120,000 tons.

In addition, the Japanese consented to a number of other restrictions on their high-seas fishery. The process of closing fishing grounds to Japanese fleets, which resulted in their being completely shut out from the Sea of Okhotsk at the 1958 negotiations, has now spread to the Pacific, with establishment of a new closed area north of 48° N. between the Kuriles and 160° E. The closed waters around the Komandorski Island have also been slightly widened. The Japanese have undertaken to enlarge the mesh of their nets to 65 millimeters (2.56 inches) knot-to-knot over a four-year period beginning in 1960 and to begin studies leading to an increase in net-twine diameter. The 1959 red salmon catch quota has been cut to 8 million fish from last year's 11 million, with the additional proviso that not more than 2.5 million of these are to be taken west of 165° E.

The 16 canneryships and 460 fishing boats were due to sail on May 15. The sailing may be delayed, however, unless canneryship operators and fishing vessel owners come to a speedy agreement on fish prices. Since it has not been possible to reduce the participating fleets below last year's level, despite the sharply reduced total catch limit, the fishing boat operators are seeking an increase in fish prices of about 25 percent to enable them to break even at the expected average catch per boat. In any event, it is being predicted that there will have to be a thorough reorganization and a considerable reduction of the fishery before next season, and the boat owners who expect to be squeezed out are already beginning to talk of seeking compensation from the Japanese Government, the United States Embassy in Tokyo reported on May 15, 1959.

JAPAN PROPOSES CUT IN SALMON QUOTA AT MEETING:

A North Pacific salmon catch quota of 90,000 tons for this year was proposed by Japan May 10, 1959, at the 38th session of the Commission meeting in Tokyo. The Japanese also proposed a quota of 80,000 tons for 1960. The Russians referred the proposal to Moscow. Originally Japan had asked for a quota of 160,000 tons for this season and gradually scaled it down

International (Contd.):

to 110,000 tons. On the other hand, Russia insisted that the quota be 70,000 tons.

Japan decided to scale down her salmon quota in order to avoid prolonged negotiations because the salmon fishing season was about to start. Japanese salmon fishing fleets were ready to sail from Hakodate, Hokkaido, Japan's northernmost main island, as soon as approval was granted by the Japanese Government.

Russians told the Japanese that next year's catch should be decided on the basis of the status of the fish resources when the Commission meets next year.

On May 10 the Commission adopted two resolutions (1) urging both governments to conduct a joint scientific survey of salmon, salmon trout, herring, and crab resources, and (2) to exchange scientists and fishery experts.

By late April it was reported that, in addition to what had been agreed upon by that time, the Russians were attempting to get agreement from Japan for establishing a fish corridor stretching from the entrance to Onkotan Channel up to longitude 160° E. in the Pacific and another corridor stretching from the entrance to Urup Channel eastward up to longitude 160° E. The Russians had indicated that if Japan would agree to establishing those corridors to permit spawning salmon to migrate to the Russian streams unmolested, the Japanese salmon catch quota might be increased from the Russian proposal of 70,000 metric tons. On the other hand, the Japanese lowered their original quota of 165,000 tons to 130,000 tons.

At that time, in view of the trend of the negotiations, the Japanese salmon industry agreed to reduce its salmon mother-ship fleet in the North Pacific from 16 to 13.

INTERNATIONAL WHALING COMMISSION

PROTOCOL TO WHALING CONVENTION RATIFIED BY BRAZIL:

The protocol amending the International Whaling Convention of 1946, done in Washington on November 19, 1956, has

been ratified by Brazil and deposited with the U. S. Department of State on May 4, 1959. The ratification of the protocol by Brazil completed the required number of signatory countries and the protocol entered into force on that date pursuant to Article III (2), the U. S. Department of State reported on May 5, 1959.

UNITED NATIONS

STATISTICS ON FISH LANDED IN FOREIGN COUNTRIES:

Statistics on fish landed by fishing craft of one country in ports other than those belonging to that country are treated differently by various countries. Since it is desirable that those landings be included in national fishery statistics in a uniform manner, the eighth session of the United Nations Statistical Commission in 1954 recommended as follows:

"Wherever the size of landings is of importance and wherever it is possible to do so, countries should include in their import statistics fish landed directly from foreign fishing craft and include in their export statistics fish landed abroad by 'domestic fishing craft'."

The ninth session of the United Nations Statistical Commission endorsed the proposal in 1956.

At the Food and Agriculture Organization meeting on fishery statistics in Edinburgh, Scotland, in September 1958, a review will be made of the progress the various nations have made in adopting the recommendation.

WHALING

THREE WHALING NATIONS DISCUSS ANTARCTIC QUOTA PROBLEM:

Representatives of the whaling industries of Norway, Japan, and Great Britain met in Oslo on April 24 and 25, 1959. In a release to the press by the Norwegian Whaling Association it was stated that the discussions were a continuation of the talks held in Tokyo last February between representatives of the Norwegian and Japanese industries in regard to the question of the distribution of the whale quota among the whaling nations. No agreement was reached during the Oslo discussions, but it is expected that the

International (Contd.):

matter will be brought to a conclusion at a meeting of the representatives of the Governments of Great Britain, Japan, the Netherlands, and Norway in London in the near future, the release stated.

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FOUR NATIONS FAIL TO REACH AGREEMENT ON ANTARCTIC BLUE-WHALE UNIT QUOTA:

Government and whaling industry representatives from Japan, Norway, the United Kingdom, and the Netherlands met in Tokyo May 18-22, 1959, to discuss the allocation of the 1960 Antarctic baleen whale catch among their fleets. The conference stemmed from the decision taken by the five Antarctic whaling nations at London in November 1958 to abandon the practice of free competition for the whales under an over-all catch limit set by the International Whaling Commission. Because this free competition was causing financial distress to some of the European whaling companies, it was decided at the London conference to allot 20 per cent (3,000 units) of the total catch quota of 15,000 blue-whale units to the Soviet Union, on condition that the Soviet fleets would not be increased unduly in the next few years. The Tokyo conference failed to solve the problem of allocating the remaining 12,000 blue-whale units among the four other countries.

A number of preliminary meetings--one between Norwegians and Japanese at Tokyo in February 1959, one at Oslo among Japanese, British, and Norwegians late in April 1959, and one at Amsterdam between the Norwegians and Dutch early in May 1959--failed to reconcile the various claims by those nations to what they consider their fair share of the whale catch. According to Tokyo trade press sources, the most active line of maneuvering has been a Japanese attempt to induce the Norwegians to retire three fleets and sell their catch rights to Japan, with the Norwegians simultaneously trying to buy the single Netherlands whaling fleet. Each country is, of course, demanding an allocation that would guarantee profitable operation of its fleets.

It is expected that the International Whaling Commission, to which 17 nations belong (including the United States) will try to find a solution at its annual meeting scheduled for June 24 in London. At that time there will be only six days before the June 30 deadline, when the conditional withdrawals of Japan, the Netherlands, and Norway from the International Whaling Convention become effective. These conditional withdrawals were made as bargaining moves in the struggle for catch allocations, but if they are carried through, the Antarctic whale stocks will in effect be exposed to unlimited exploitation. It is generally accepted that unlimited catching would soon reduce the resource to the point where only the State-supported fleets could afford to continue operations, the United States Embassy in Tokyo reported on May 15, 1959.

According to a dispatch from Agence France Press, the chairman of the Norwegian Whaling Council, who headed the 6-member Norwegian delegation to the non-productive Tokyo talks, said that Great Britain offered to reduce its share of the undistributed 12,000 blue-whale units from 2,250 to 2,200 units, while Norwegian negotiators indicated willingness to cut Norway's quota by 100 units, subject to government approval, to make it 5,000. The Netherlands and Japan, on the other hand, adhered to their demands of 1,200 and 4,900 units, respectively. The limit for the annual catch is set each year by the 18-nation International Whaling Commission.

Meanwhile, the Norwegian Whaling Council has published No. 41 and No. 42 of International Whaling Statistics, showing the decline in the number of blue whales caught in the Antarctic during the period between February 1 and March 4, in percentage of the combined blue whale and finback catch. In the 1931/32 season, blue whales constituted 61.9 percent of the catch. In the last season before World War II, 1937/38, the percentage dropped to 16.5 percent. Since the war, through the 1951/52 season, the percentage of blue whales varied between 31.9 and 22.9, with a radical drop in the following six seasons. In 1955/56 the blue whale percentage was down to 11.5 and for the entire 1957/58 season it was only 6.3 percent.

Note: One blue-whale unit equals 1 blue whale, 2 finbacks, 2½ humpbacks, or 6 sei whales.

Aden

FISHERIES TRENDS, 1958:

During 1958 the Aden Colony Fisheries Department program for modernization of the fishing industry continued to meet with success. Three additional boats were mechanized and four more were in the process of being mechanized. The fleet of mechanized fishing vessels numbered 27 as of the end of the year. In addition, nylon nets continued to replace nets made of cotton or hemp and during the year 70 nylon nets were purchased by the fishermen.

Biological and technical studies carried out during the year indicated that good fishing grounds existed 10-15 miles offshore. The problem faced by the Fisheries Department was ways and means of inducing the conservative fishermen to give up their old habit of fishing close to shore and try new and more distant grounds. The technologists of the Department prepared and shipped a sample of pickled mackerel to Zanzibar. The shipment was well received and once the new fish processing station is completed a new export market may be developed.

The amount of cured fish produced for export increased to 3,121 long tons as compared with 2,750 tons in 1957. Fish meal exports in 1958 reached 478 tons and showed a satisfactory increase for the third year in a row. The fisheries officers are hoping that the effect of the summer monsoon season on the catch will be offset in the future by modernization of the fishing fleet, the United States Consul at Aden reported on February 26, 1959.



American Samoa

MORE KOREANS FISH FOR TUNA CANNERY:

The first Korean tuna long-line vessel to fish for the tuna cannery in American Samoa arrived early in 1958, and a second vessel arrived in September 1958. Six additional Korean vessels were reported to be scheduled to enter this fishery under contract to the tuna cannery (Pacific Islands Monthly, March 1959).

The American Samoa cannery is operated by a United States west coast tuna canning company.



Australia

TUNA FIRM CONDUCTS SURVEY OF CONSUMER EATING HABITS:

As part of a campaign to sell more fish, a New South Wales tuna canning firm with factories at Eden and Narooma, is sponsoring a survey of the eating habits of Australians. Although the survey is incomplete, early returns indicate that about 52 percent of the Australian families eat fresh or frozen fish--about three times as much fresh as frozen, and mostly prefer flathead and bream. At least 96 percent of the families interviewed eat some kind of canned fish. The complete survey will cover thousands of families and the results will be analyzed by the University of New South Wales.

Most of the big chain food stores are featuring canned tuna in weekly specials and the tuna cannery sales manager states that sales are booming. The special price for a large can of tuna is 2s.5½d. (about 27.5 U. S. cents.)

The New South Wales tuna canning company handled about 2,000 long tons of tuna in 1958. A determined effort will be made to develop an export trade in frozen tuna to the United States. Representatives of the firm were in the United States in April surveying prospects for frozen tuna exports.

TUNA LANDINGS HIGHER IN 1958/59 SEASON:

Landings of tuna from the late fall and winter fishery off South Australia and New South Wales were over 2,369 tons, or more than 68 percent higher than the 1,495 tons reported from the same areas the previous season. The landings in South Australia and New South Wales make up about 90 percent of the tuna landed in Australia.

Most of the tuna landed in Australia is canned or frozen. As a result of an

Australia (Contd.):

early 1959 visit of an Australian trade mission to the United States, there is some prospect that tuna shipments to west coast United States canners will be resumed. The last shipments were made on a trial basis in 1951 and 1955. As the catch of tuna in Australia is limited at the present time by lack of freezer space in Australian fishing ports, exports of all types of tuna (frozen and canned) to the United States and other countries will not exceed 2,000 tons. (United States Embassy in Canberra reported on May 6, 1959.)

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FISH CANNING INDUSTRY:

Australia imported large quantities of canned fish before World War II. During the war years, much effort was put into developing the fish canning industry. To protect its young industry, the Government imposed restrictions on the imports of canned fish. This hurt several exporting nations, especially Norway.

At present, Australia has 17 fish canning factories. Most of them were built recently and are equipped with the most modern facilities, including refrigeration units for storage. A few factories have special installations for holding fish in sea water at temperatures of 0°-1° C. (32°-34° F.), which keeps fish fresh for 7 or 8 days.

Annual fishery production in Australia amounts to about 400,000 metric tons of fish and 14,000 tons of crustaceans. Australia imports about 8,000 tons of refrigerated or frozen fish a year. Production of canned fish totals about 3,000 tons annually, but an additional 3,000 is imported each year to satisfy the demand (Industria Conserva, Vigo, Spain, January 1959).

* * * * *

PLAN TO USE HELICOPTERS TO PICK UP SHRIMP FROM FISHING VESSELS AT SEA:

Helicopters may soon be used as delivery vans for shrimp from the Rockhampton grounds off Queensland, Australia. Under a plan now being worked

out, a helicopter will be sent to the shrimp fleet in Keppel Bay to pick up catches from the boats for immediate delivery to markets. The helicopter was expected to begin operations when shrimp fishing began in the Keppel Bay area in April or May. Hovering over trawlers, the helicopter will haul the baskets of shrimp up from the boats on a winch-powered cable and hook. The helicopter would also take supplies out to the shrimp boats to enable them to stay at sea longer.



Belgium

CONSUMPTION OF FISHERY
PRODUCTS, 1958:

During 1958 the consumption of fishery products in Belgium amounted to 117,099 metric tons (about 258 million

Table 1 - Belgium's Consumption of Fishery Products, 1958

Consumption of	Fresh	Processed	Canned	Total
..... (Metric Tons)				
Market Fish:				
Herring/...	9,246	12,289	-	21,535
Sprat/...	1,756	-	-	1,756
Mackerel/...	1,341	168	-	1,509
Pilchard/...	65	-	2,646	2,711
Sardines/...	-	-	3,648	3,648
Salmon/...	-	-	3,601	3,601
Other fish...	1/46,577	641	4,994	52,212
Total fish...	58,985	13,098	14,889	86,972
Consumption of				
Shellfish:				
Shrimp...	3,157	-	-	3,157
Lobster &				
Crawfish...	493	-	1,636	2,129
Mussels...	21,761	-	-	21,761
Oysters...	1,440	-	-	1,440
Other shellfish	1,640	-	-	1,640
Total shellfish	28,491	-	1,636	30,127

1/ Bulk used for canning.

2/ Nearly all consumed fresh.

pounds). The total included 86,972 tons of marine finfish and 30,127 tons of shellfish (United States Consulate in Antwerp, report dated May 13, 1959.)

* * * * *

IMPORTED CANNED
TUNA PRICES, MAY 1959:

Imported canned tuna prices c.i.f. Antwerp, Belgium, early in May 1959 were as follows: all solid pack in oil, 48 cans/cs. Japan: lightmeat, 7-oz. US\$7.00 and 3½ oz. \$3.80; whitemeat, 7-oz. \$8.00 and 3½ oz. \$4.25; and Peru: lightmeat, 7-oz. \$6.30 and 3½ oz. \$3.80. About all the tuna imported into Belgium comes from Japan

Belgium (Contd.):

and Peru, the United States Consul in Antwerp reported on May 13, 1959.



Brazil

NEW FISH PROCESSING PLANT:

A new fish processing plant was scheduled to begin operations in June near the town of Maracana which is located on the Brazilian coast about 60 miles northeast of Belem and near the mouth of the Amazon River. The new plant expects to process fish and shellfish caught in the Amazon River and its tributaries and from the Atlantic Ocean. This fish plant will be the first of its kind to operate in that area. Processing operations will include the freezing of fish and shellfish, the drying of "pirarucu" for sale in Belem and the Braganca railroad region, canned fish for export, and possibly the importation of cod for further processing.



British Honduras

FISHERY PRODUCTS

EXPORTS HIGHER IN 1958:

Exports of fishery products from British Honduras were higher in 1958. Exports of fish remained steady, but spiny lobster exports increased from US\$178,000 in 1957 to more than \$225,000 in 1958. Exports in 1955 were valued at only \$90,000. Reasons for the increase were due to a better "run" and less "anarchy" in the local industry, resulting in a more intensive effort.

There is now only one purchaser for packing and export. The Government apparently believes there is room for one more concessionaire although the reasons for this belief appear to be based on the desire for competition and the fact that the 1958 catch was relatively good. Nearly all of the entire catch of spiny lobsters is shipped by air to the United States. Fishing methods remain primitive although the one concessionaire (an American-owned company) has some modern

equipment. Most of the catch is made by small privately-owned fishing sailboats.



Canada

DOGFISH ERADICATION PROGRAM DISAPPOINTING:

Canada's west coast dogfish eradication and subsidy program, which ended March 31 after three months of fishing, was "very disappointing," according to a fisheries department spokesman in Vancouver, B. C.

A total of 2,470 tons of the shark-like predators was taken in two separate operations on dogfish populations in the Gulf of Georgia. Biologists estimated that to keep the population under control, about 30,000 tons of dogfish should be killed every year.

British Columbia fishery interests, despite the failure of the three-months fishery, are asking the government to re-establish the program. The groups want a \$250,000 fund to be set up again and the operation spread over a full calendar year. Reports of trawler skippers who took part in this winter's fishery indicate that dogfish are not present in the Gulf during the winter months, and they say that a summer and fall fishery would be much more productive.

Only \$67,300 of the \$250,000 set aside for the program was used during the winter's fishery. The time limit set on the subsidy program was up on March 31, and on that date the remainder of the money went back into general funds. The killing program, using chartered trawlers, was split into two separate fishing periods. The first (from January 19 to February 15) was the most disappointing, with 5 boats taking less than 250 tons. The second part of the program (from March 9 to 31) was more successful, with only 3 boats taking about the same tonnage in the shorter period. Boats lost 5 days of fishing in this second phase because of seasonal bad weather in the Gulf, which saw gale force southeast winds blowing for unusually long periods.

The liver program continued uninterrupted from January 12 to March 31, and accounted for 353,000 pounds of livers landed at Vancouver and Steveston. All but 8,000 pounds of the total came from the Gulf of Georgia. The livers were produced entirely by independent trawlers and long-liners.

Cost of the dogfish on a tonnage basis was rather high. The government paid an average of \$27.40 a ton, including the cost of the charters and the subsidy of 10¢ a pound on livers. For the charter boats alone, the cost of catching dogfish was \$45 a ton.

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QUEBEC FISH INSPECTION NOW UNDER FEDERAL GOVERNMENT:

Responsibility for administering the Fish Inspection Act and the Meat and Canned Foods Act as it concerns fishery products in the Province of Quebec has been transferred by mutual agreement from the Government of Quebec to the Government of Canada, the Fisheries Minister announced in Ottawa on May 19. The transfer was effective as of April 1, 1959.

In 1923, by agreement between the two governments, the administration of Quebec's fishery resource became the

Canada (Contd.):

responsibility of the Province. Except for fish inspection, this arrangement continues with respect to the control of the commercial fisheries under the Fisheries Act.

The formation of the Quebec Area completes the establishment, to bring about uniform inspection on a national basis, of the Inspection and Consumer Service of the Federal Department of Fisheries.

COMMERCIAL FISHING
LICENSES ISSUED IN BRITISH
COLUMBIA INCREASED IN 1958:

A record number of commercial fishing licenses was issued during 1958 to British Columbia fishermen. In 1958 14,266 licenses were issued as compared to 12,016 in 1957.

engaged in commercial fishing on a part-time basis.

Of the 14,266 licenses issued, it has been estimated that only about 7,700 represented fishermen who are wholly or primarily dependent on the fishing industry for a livelihood.



Typical of the vessels used in British Columbia fisheries are gill-netters--the most common type of vessel used to catch salmon on the west coast of Canada. Purse-seiners and traps are also used to catch salmon.

The increases have been attributed primarily to the fact that expectations for the 1958 fishing season were high and a large number of sport fishermen

In 1958, 3,673 persons took out licenses for the first time. Of this group, 1,623 were trollers, 1,313 were gill-netters, and 409 were assistants in salmon purse seiners.

Canada (Contd.):

**ATOMIC POWER MAY CANCEL
NEED FOR HYDROELECTRIC POWER
FROM RIVERS WITH FISH RUNS:**

Atomic power may eliminate any need to develop the hydroelectric potential of the Fraser River in British Columbia, declares the Canadian Fisheries Minister. Development of the hydroelectric potential of the Fraser "may be a passing thing," he said, "because economic atomic power might be possible soon. But the need for fish as a high-protein food is becoming greater annually." The Minister told the Canadian Commons Fisheries Committee late in April that any hydroelectric program on the Fraser which would wipe out its salmon industry for a temporary benefit would be very poor reasoning.

"This is a powerful argument in favor of steps to safeguard fish resources now and in the future," he said. These observations were made by the Minister during a study of a preliminary report on flood control and hydroelectric power in the Fraser River basin.

The Minister said the least objectionable plan for flood control and power development proposed no construction of dams on the main stem of the Fraser.

"At present there is no economic or practical device which can be recommended to pass migrant young salmon safely downstream at high dams," the Minister noted about other plans.

He said the demand for power was growing at a phenomenal rate. But there are alternatives to development of the Fraser, including the Columbia and Peace River systems. A huge coal-burning thermal plant being built in the Vancouver area would also relieve pressure.

The most immediate problem, however, was flood control. This could be achieved by building dams on Fraser tributaries. Some power also would be produced and the \$34 million salmon fishery would not be threatened.

The director of conservation for the Fisheries Department said, "we can have

flood control and fish." The best method is construction of dams in the upper reaches of the river.

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**MARKETING OF NEWFOUNDLAND
SALTED GROUND FISH:**

On August 1, 1958, the Canadian Government decided that the exclusive right to export processed salted fish from Newfoundland, held by the Newfoundland Associated Fish Exporters Limited, would not be extended beyond July 31, 1959. By the Act of Union between Canada and Newfoundland, the exclusive license to export salted fish, which had been granted to that Organization by the Commission of Government, was continued for a period of five years in order to allow the orderly development of alternative marketing arrangements during this period of transition. At the expiration of the license arrangement in 1954, it was again agreed to continue the exclusive license for a further period of three years, with the qualification that interprovincial trade in salt bulk was freed from this restriction. Subsequently, two extensions of one marketing year each were granted, the final one on August 1, 1958. Thus, the salt fish industry of Newfoundland has had a ten-year period in which to adopt marketing methods in conformity with the practice of this trade in other Canadian Atlantic Provinces and Quebec.

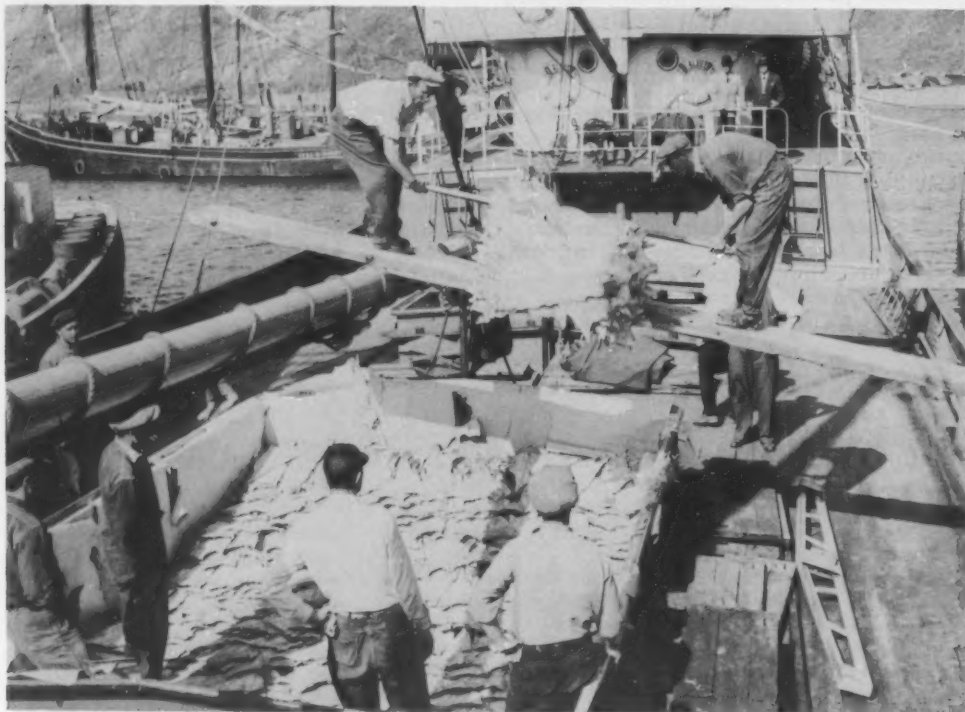
Serious consideration was given to alternative methods of marketing salt fish in Newfoundland. An Interdepartmental Committee made an extensive and exhaustive survey of the situation. Exporters, processors, fishermen, and government officials in the Atlantic Provinces and the Province of Quebec were interviewed and were given an opportunity to present their views.

After full consideration of all aspects of the trade, it was not found possible nor deemed in the best interests of the salt fish industry to adopt alternative methods of controlled marketing in the Province of Newfoundland. Accordingly, the export marketing of Atlantic Coast salted fish after July 31, 1959, will be carried out on the basis of free competition.

Canada (Contd.):

The Government will continue its present practice of supervising the inspection of Atlantic Coast salted fish by

the Department of Fisheries and will extend to exporters trade promotion assistance through the Department of Trade and Commerce in Canada and our Trade Commissioner Service abroad.



Freighter loading Newfoundland salted cod for delivery to Portugal.



Ceylon

**JAPANESE AID SOUGHT
IN 5-YEAR FISHERY PLAN:**

Ceylon has requested Japan's full co-operation in a \$70 million five-year fishery program scheduled to start in October 1959. The gigantic project envisages construction of harbors, fishing fleets, and refrigeration plants.

The fishery program was based on a report submitted last fall to the Ceylonese Government on findings of a Japanese survey mission.

Despite a huge demand for fish in Ceylon, output is only 30 percent of the demand and some \$100 million worth is imported yearly. Under the five-year project, the amount imported is to be replaced by domestic fisheries.

Although it is not yet known to what extent the Japanese Government will co-operate, observers point out that it would be difficult for Japan to participate in the harbor construction project since this would call for an Export-Import Bank loan.

Ceylon (Contd.):

Opinion favoring the acceptance of the Ceylonese proposal is said being advanced

The Government, however, is giving careful consideration to the project in view of relations with other countries, such as Thailand, which is also seeking



Beach seine fishing in Mullativu, Ceylon.

within the Government since the country is one of Japan's major markets (last year's exports totaled \$36 million and imports \$5.7 million).

Japan's help in the construction of fishing ports. (*The Japan Times*, April 14, 1959.)



Cuba

CLOSED SEASON FOR BULLFROGS, SPONGES, AND CERTAIN FINFISH:

The National Fisheries Institute of Cuba revoked the closed season invoked on April 1, 1959, on the capture of bullfrogs. The termination order effective on April 30, 1959, was published in the *Official Gazette* of April 28, 1959. The reasons given for the revocation was that the bullfrog spawning season was al-

ready over, plus economic and social demands on the part of fishermen and packers whose main source of income is the export of frog legs to the United States.

Another resolution, published in the *Official Gazette* of April 29, 1959, imposed a closed season on the capture of sponges effective May 5, 1959, in the northern maritime zone of Caibarien and the southern maritime zone of

Cuba (Contd.):

Batabano. Sponge fishing is still permitted off the north coast of Vuelta Abajo in the province of Pinar del Rio. The closed season will remain in effect until cancelled by a subsequent resolution.

The same resolution also imposed closed seasons, effective May 5, 1959, on the following fish species, to remain in effect until cancelled by subsequent resolutions: *Biajaiba* (Lane Snapper), *Corvinas* (Croakers), and *Robalos* (Snooks)--United States Embassy, Havana, dispatch dated May 18, 1959.



Denmark

FISH MEAL PRODUCTION, IMPORTS AND EXPORTS, 1958:

Production of fish meal in Denmark increased about 14 percent, or from 58,000 metric tons in 1957 to 66,000 tons in 1958. The total available supply (production, imports, and stocks on hand) increased from 69,000 tons in 1957 to about 80,000 tons in 1958, due to increases of 8,000 tons in production and 4,000 tons in imports. The increased production in 1958 was due to better landings of herring and sand eel or launce. Consumption of meal in Denmark was 22,000 tons in 1958 and 24,000 tons in 1957.

In 1958 a total of 53,000 tons were exported as compared with 42,000 tons in 1957. Denmark's best customers for fish meal were the United Kingdom with 23,000 tons or 44.1 percent and Holland with 16,000 tons or 31.7 percent. The United States purchased 991 tons, and the balance of the exports of about 53,000 tons was exported to 10 other countries.

Table 1 - Danish Exports and Imports of Fish Meal, 1958

Destination	Herring Meal	Other Fish Meal	Total
(Metric Tons)			
Exports:			
United Kingdom	22,739	585	23,324
Holland	16,114	639	16,753
West Germany	2,799	2,470	5,269
Italy	2,446	10	2,456
United States	991	-	991
France	907	-	907
Czechoslovakia	475	-	475
Belgium-Luxemburg	396	-	396
Finland	341	-	341
Mexico	280	-	280
Philippines	207	-	207
Switzerland	95	1/	95
Sweden	81	398	479
East Germany	-	894	894
Other countries	-	15	15
Totals	47,877	5,011	52,888
Origin			
Imports:			
Iceland	90	6,926	7,016
Norway	-	3,832	3,832
Totals	90	10,758	10,848
1/ Less than 1 metric ton.			

Imports of fish meal by Denmark totaled 11,000 tons--all from Iceland and Norway.

MARINE OIL EXPORTS, IMPORTS, AND SUPPLIES, 1958:

During 1958 the available Danish supplies of marine oils (fish-liver oil, fish oil, and marine-mammal oils), totaled 40,099 metric tons or 2,000 tons more than in 1957. This relatively minor increase was due to a larger domestic production as well as to increased imports of herring oil from West Germany, which more than offset a reduction of the whale oil imports. The larger domestic production of fish oil was due to increased landings of herring and launce or sand eel. The reduced imports of whale oil are explained by smaller requirements

of the margarine industry, the output of which was reduced in 1958.

The requirements of marine oils for both domestic and export purposes increased roughly by 4,000 tons. Consequently, the inventories of marine oils were reduced throughout 1958 as the supplies only increased 2,000 tons. Whale oil was the principal stock that was reduced. This seems a logical development as it is expected that the margarine industry will use smaller quantities than formerly. In other words, reduction of inventories may be considered a process of adjustment to lower requirements.

Denmark (Contd.):

The increased exports of 2,000 tons of marine oils were made up of primarily herring oil. The major share of the in-

creased exports was shipped to Sweden and West Germany. (Foreign Agriculture Service of the U. S. Department of Agriculture report from Copenhagen dated April 17, 1959.)

Table 1 - Danish Supply and Distribution of Marine Oils, 1957-1958

Table 1 - Danish Supply and Distribution of Marine Oils, 1957-1958								
Type	Opening Stocks Jan. 1	SUPPLY			DISTRIBUTION			
		Production	Imports	Total Supply	Exports	Consumption	Ending Stocks Dec. 31	Total Distribution
1958				(Metric Tons)				
Fish-liver oil	n.a.	200	1,416	1,616	119	1,497	n.a.	1,616
Fish (incl. herring) oil	2,298	16,980	5,235	24,513	11,349	9,383	3,781	24,513
Whale and seal blubber oil	n.a.	1,000	16	1,016	-	1,016	n.a.	1,016
Whale oil	7,747	n.a.	5,099	12,846	102	9,073	3,671	12,846
Seal oil	n.a.	106	2	108	98	10	n.a.	108
Total	10,045	18,286	11,768	40,099	11,668	20,979	7,452	40,099
1957								
Fish-liver oil	n.a.	200	1,736	1,936	316	1,620	n.a.	1,936
Fish (incl. herring) oil	706	13,957	2,603	17,266	8,593	6,375	2,298	17,266
Whale and seal blubber oil	n.a.	1,000	-	1,000	-	1,000	n.a.	1,000
Whale oil	7,606	n.a.	10,263	17,869	105	10,017	7,747	17,869
Seal oil	n.a.	n.a.	20	20	14	6	n.a.	20
Total	8,312	15,157	14,622	38,091	9,028	19,018	10,045	38,091
n.a. = not available.								

n.a. = not available.

Table 2 - Denmark's Imports of Marine Oils by Country of Origin, 1958

Table 2 - Denmark's Imports of Marine Oils by Country of Origin, 1958					
Country	Oil			Other	Total
	Fish-liver	Herring	Whale		
			(Metric Tons)		
West Germany	296	3,951	3	-	4,250
Norway	853	385	5,096	1/18	6,352
Iceland	220	1	-	-	221
Sweden	1	478	-	-	479
United Kingdom	45	-	-	-	45
Angola	-	370	-	-	370
Other	1	50	-	-	51
Total	1,416	5,235	5,099	18	11,768
1/ Whale and seal blubber (16 tons) and seal oil (2 tons).					

1/ Whale and seal blubber (16 tons) and seal oil (2 tons).

Table 3 - Denmark's Exports of Marine Oils by Country of Destination, 1958

Country	Oil				Total
	Fish-liver	Herring	Whale	Seal	
	(Metric Tons)				
West Germany	57	2,063	31	56	2,207
Norway	-	1,513	-	2	1,515
Sweden	28	7,082	-	22	7,132
Italy	5	9	28	18	60
Belgium-Luxemburg	5	26	-	-	31
Spain	4	163	-	-	167
Czechoslovakia	-	251	-	-	251
Hungary	15	222	43	-	280
Other	5	-	-	-	25
Total	119	11,349	102	98	11,668

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REVIEW OF FAROE

ISLANDS FISHERIES, 1958:

Salted fish production in 1958 amounted to 29,850 metric tons or 450 tons above 1957. Landings from off the coast of Iceland of 7,800 tons were lower than in 1957, but the landings from the fisheries off Greenland were a record 19,250 tons in 1958 (12,800 tons in 1957). Local fishing around the Faroe Islands yielded 1,550 tons of salted cod as compared with

2,800 tons the preceding year. The drop was due to an increase in the sale of 11,000 tons of fresh iced-fish to the British--about double the 1957 figure. Herring landings in 1958 of 136,000 barrels were about the same as for 1957. The whaling industry had a poor year in 1958 with only 57 whales captured as compared with 199 the preceding year.

Exports of all products from the Faroes in 1958 totaled 91.7 million kroner

Denmark (Contd.):

(US\$13.3 million), about the same as in 1957. Exports of salted fish accounted for 21.3 million kroner (US\$3.1 million) as compared with 15.6 million kroner (US\$2.3 million) the year before while dried fish exports of 33.2 million kroner (US\$4.8 million) in 1958 were down about 5.3 million kroner (US\$767,000) from 1957. As of January 1, 1958, inventories of exportable products amounted to 12.5 million kroner (US\$1.8 million).

Exporters of salted fish in 1958 were beset by difficulties in selling dried fish to Spain and Brazil. Payments on exports to Spain were slow and conditions in the Brazilian market were unsettled. The difficulties experienced in selling dried cod brought about increased sales of salted fish. This development resulted in less call for loans by the fishing industry since export of salted fish results in quicker payment to the processors of the fish.

The Faroe Islands fishing fleet was increased by one vessel in 1958.

The Bank of the Faroes loaned 22.8 million kroner (US\$3.3 million) to the fishing and fish processing industry in 1958, according to the annual report of the Føroya Bank in Thorshavn, the largest bank in the Faroe Islands. (United States Embassy, Copenhagen, report dated March 25.)



El Salvador

SHRIMP FISHERY TRENDS:

On February 7, 1959, the largest fishing company in El Salvador inaugurated a shrimp freezing plant and a pier for its 6 boats at its Pacific Coast base of operations at Puerto El Triunfo, on the Bay of Jiquilisco. Prior to construction of this pier, fishing boats operating from this "port" have had to be loaded and unloaded across extensive mud flats. The freezing installation, which uses power brought in over a new transmission line, has a freezer with a rated hourly capacity of some 3,500 pounds and a cold-

storage room for some 180,000 pounds of shrimp. The frozen shrimp is trucked to San Salvador, from where the largest proportion is then flown to the United States.

At the inaugural ceremonies at Puerto El Triunfo, a company spokesman emphasized the contribution that this relatively new industry is making to the economy and made a strong plea for more Government support (issuance of licenses to operate additional fishing boats). The firm is presently capitalized at US\$400,000, of which half is Salvadoran, about 45 percent that of the Portuguese fishermen who brought in the boats, and the balance Panamanian.

The 1958 landings by Salvadoran fishermen amounted to 1,116,879 pounds of fish, 846,051 pounds of shrimp, and 92,191 pounds of small shrimp (camaroncillo), according to preliminary Government statistics. The shrimp landings are believed to be a mixture of heads-on and heads-off weight, but principally heads-off.



German Democratic Republic

CANNED TUNA PRICES, MAY 1, 1959:

Importers and other trade sources in West Germany report that most of the canned tuna imported is of Japanese and Peruvian origin. According to trade sources in the Hamburg area imported canned tuna prices (c.i.f. Hamburg) as of May 1, 1959, were: Japan; all solid pack, 48 cans per case; light meat (skipjack and yellowfin) in cottonseed oil, 7-oz. cans US\$6.50-6.80, 3½-oz. cans \$3.65-3.85; light meat (bluefin and big-eyed) in cottonseed oil fancy B, 7-oz. cans \$6.35, 3½-oz. cans \$3.50; light meat (skipjack and yellowfin) in aspic, 7-oz. cans \$6.40 a case; flakes, 7-oz. cans \$6.40-6.45; Peru: light meat in cottonseed oil, solid pack, 48 cans/cs., 7-oz., top brand, \$6.75; other brands, \$6.20-6.35; 3½-oz. 96 cans/cs., \$6.45.

Prices c.i.f. Hamburg for the top Peruvian brand (fancy white solid pack in cottonseed oil for a case of 48 7-oz. cans) rose from \$5.45 as of April 15 to \$6.75

German Federal Republic (Contd.):

on or about May 1. Light meat solid pack in cottonseed oil as of May 1 was \$6.20-6.35 for 7-oz. cans (48 to the case) and \$6.45 for 3½-oz. cans (96 to the case). The Hamburg importers expect some decrease in c.i.f. canned tuna prices from the pack of the 1959 season.



Iceland

GROUND FISH LANDINGS IMPROVE IN APRIL:

The groundfish catches in April 1959 by Icelandic inshore vessels improved so much that it now appears likely that, despite the poor catches in February and March, the total catch of the main winter season will exceed last year's record. Ordinarily, catches fall off in late April, although the season does not officially end until May 10. However, catches continued good this April and freezing plants were working overtime.

The best quality cod is caught earlier in the season, by the line boats, but the bad weather limited the catches of fish at that time. A higher proportion of the present catch is being rejected by the freezing plants as unfit for filleting--though suitable for stockfish. It is by no means certain, therefore, that the export value of the catch will be as high as in 1958, according to an April 24, 1959, dispatch from the United States Embassy in Reykjavik.

CONTRACTS FOR THREE LARGE TRAWLERS FROM WEST GERMANY:

The Icelandic press has announced that contracts have been signed by private owners for the construction of three large trawlers by a West Germany shipyard to be financed by a ten-year West German bank credit. Two of the 950-ton ships will be purchased by a herring and fish meal factory at Akranes, and the third by a fish producer of Akureyri. The contracts are subject to approval by the Icelandic Government, which must guarantee the loans. If the contracts are approved, the trawlers will be delivered January 31, 1961.

The bulk of the Icelandic large trawler fleet has returned to the Newfoundland fishing grounds, two months ahead of last year. It is primarily for this distant type of fishing that the larger trawlers are needed, according to an May 22, 1959, dispatch from the United States Embassy in Reykjavik.

LARGE TRAWLER TO BE BUILT IN WEST GERMANY:

The town council of Hafnarfjörður, Iceland, has authorized the municipal trawler company to proceed with a contract to build a 900-1,000 ton super-trawler in Bremerhaven, West Germany. The new vessel will replace the trawler *Juli*, lost with all hands this past winter. The new trawler, when completed, will be the largest in Iceland and will have a capacity of 500 metric tons of iced fish, the United States Embassy in Reykjavik reported on April 24, 1959.

INVESTMENT IN FISHING INDUSTRY HIGHER IN 1958:

Investments during 1958 in the Icelandic fishing industry are estimated to be up about 8 percent as compared with 1957, with an increase in the tonnage of the fishing fleet more than offsetting a decline in additions to processing plants. For the purposes of asset formation, investment in fishing vessels is calculated on the basis of construction performed during the year, whether in Iceland or abroad for the Icelandic account, and on this basis a rise of about two-thirds over and above the 1957 level was expected. During 1958 the following vessels actually were added to the fishing fleet: 2 (replacement) trawlers, 1,491 tons total; 11 fishing boats, 1,439 tons total; and 3 (East German) trawlers, 747 tons total.

Investments in fish-processing plants in 1958 were estimated to be only two-thirds as much as in 1957, and the lowest level in four years. This was only natural, in view of the considerable idle capacity existing most of the year and especially in the smaller ports. This problem has focused public attention on the need to replenish the fleets of both the trawlers and motor boats. When

Iceland (Contd.):

ample fish supplies are delivered, freezing plants are relatively more profitable investments than boats or trawlers. But this is not so when raw material is lacking (as it has been for most plants outside the Faxa Bay and Westman Islands areas). Having succeeded in getting state loans for local freezing plants or herring factories, many of these smaller ports have now turned to the Government for help in obtaining the fishing vessels necessary to assure raw material to keep the plants operating.

The major effort to meet this problem has been the scheme to purchase 12 new East German 250-ton fishing vessels, capable of trawling in home waters. Three of these were delivered before the end of 1958, with the rest expected to arrive in 1959. All are destined for smaller ports outside the more populous southwest area of the country. (United States Consulate dispatch of April 30, 1959, from Reykjavik.)

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FISHING LIMITS DISPUTE WITH BRITISH FLARES UP AGAIN:

The refusal of the British to recognize Iceland's extension of fishing limits from 4 to 12 miles from the coastline has been the cause of friction between the two governments for some time. Two incidents concerning British trawlers (*Carella* and *Swanella*) allegedly fishing inside Iceland's four-mile fishing limit have brought the dispute in the headlines again because the British have refused to accept the Icelandic Coast Guard reckonings.

On April 18, the Iceland Ministry of Foreign Affairs released the substance of a note delivered to the Foreign Minister by the British in reply to the Icelandic note of protest of March 26, in connection with the *Carella* incident. The note said that: (1) the British Government does not recognize Iceland's fishing limits outside the three-mile territorial waters limit and therefore repudiates the right of Icelandic Coast Guard cutters to seize foreign vessels "on the high seas;" (2) the British trawler *Carella* was not within the four-mile de-

marcation as computed by the Icelandic Coast Guard cutter; (3) the British Government considers the regulations on a 12-mile fisheries jurisdiction to be invalid according to international law; and (4) pending the outcome of the prospective International Conference on the Law of the Sea in 1960, a temporary agreement on fisheries be reached either by negotiations or by referring the matter to the International Court.

An editorial in an Icelandic newspaper stated that the purpose of British "provocative action" is to lay the groundwork for world-wide support for some kind of Faroese solution (six-mile fishery limit) issue at the next Law of the Sea Conference in 1960.

The Icelandic Coast Guard reports that 29 British trawlers were sighted fishing within the 12-mile fishery limit on April 21 in three areas protected by British warships. The areas are off Adalvik, the Eldey Bank, and the Selvog Bank. (United States Embassy report from Reykjavik, April 22, 1959.)



Iran

SHRIMP FISHERY IN THE PERSIAN GULF EXPANDING:

In order to help develop the Iranian shrimp industry in the Persian Gulf, a small fleet of trawlers is being shipped to Iran. Four of the 60-foot trawlers passed through the port of New York City in mid-April on the deck of the freighter *Neidenfels*. The trawlers were loaded at Cristobal, Panama, and are scheduled to land at Khorramshahr, Iran.

In addition, the 1,000-ton mothership *Moyon I* is due at Khorramshahr around mid-May. Later an additional three trawlers will arrive, which will make a total of seven trawlers.

The shrimp fleet was outfitted by a New York City importing company. The trawlers will be manned by Americans and some Europeans who will teach the Iranians how to operate them and fish for shrimp. The President of the New

Iran (Contd.):

York importing firm points out that Iran at present has only one trawler and one mothership in operation. Shrimp shipments to the United States from that operation average about 100,000 pounds a month. With the addition of the seven

trawlers and the second mothership monthly shipments to the United States are expected to reach one million pounds a month. The New York importing firm is the selling agent in the United States for the Iranian fishing company which has the fishing rights in Iranian waters.



Israel

**TUNA FISHING COMPANY
WITH JAPANESE SWISS
PARTICIPATION IN OPERATION:**

The Shimu Maru, the vessel fishing for the Joint Israeli-Japanese-Swiss Fishing company, started operations in November 1958 and mid-April had landed two trips of tuna--600 metric tons of fish. It was expected that by mid-May a third trip of 280 tons would be landed.

The Japanese Company operating the vessel with a complement of Israeli

fishermen sells the fish to the company in Israel at \$255 a metric ton, but since there is an Israeli commodity price adjustment tax of \$380 a ton levied on frozen tuna, the actual price of the tuna is \$644 a ton delivered.

The sale of the tuna is handled by the company established in Israel. Collective farms and armed forces are the principal buyers, but a part of the fish is sold in the local markets. In spite of the high price, reports indicate that there is a demand for the frozen tuna landed by the Shimu Maru.



Italy

**ELECTRONIC DEVICE TO
MEASURE STRAIN ON
OTTER TRAWLS DEVELOPED:**

A new electronic device which fits easily on a conventional trawl winch, and which not only saves the net from being torn or lost, but tells how much fish is in the net, is in the process of being patented by an Italian inventor. The device is the successor to an earlier invention which measured only how many fish were in the net. The inventor states that his new device is a very simple arrangement of great value to the trawling fleets of the world. It will be especially useful to deep-sea trawlers, and boats dragging in rough waters.

The device consists mainly of two hinged collars attached to the terminals of the winch. Two dynamometers fitted with electroacoustical devices are coupled to the collars, and anchored to the deck.

Main purpose of the invention is to avoid destroying the net on rough bottom,

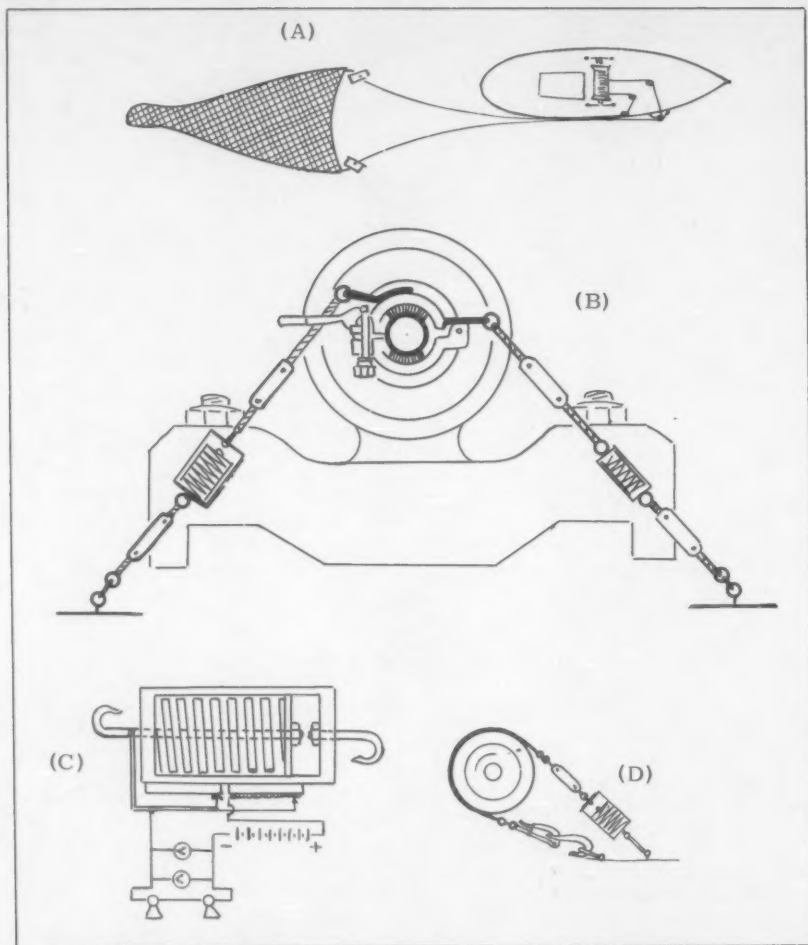
or on obstacles unseen on sounding equipment. It will also, by measuring the strain on the towing lines, give a measure of how much fish is in the net.

A warning signal, working through a voltmeter, is placed on the bridge and in the engineroom, giving a permanent and instantaneous reading of the strains developed by the trawl. A horn is sounded and a red light flashes immediately when the net becomes fouled on the bottom or on an obstacle.

The device is so set up on the winch that it automatically disengages when the strain reaches the danger level. When this brake is released the winch is then running free, letting out line until the net is free, or until the ship is stopped or diverted.

A San Francisco company is negotiating with the inventor for manufacturing rights, and it is expected the new device will be on the market within a year. Patents are pending in the United States, Canada, Italy, and Norway, and manufacturing rights throughout the world have been reserved for a year.

Italy (Contd.):



- (A) Electrical warning and correctional device fits on side of trawl winch; warns skipper and engineer when strain on towing line reaches danger point. Device also gives accurate indication of weight of fish in net.
- (B) Fitting device to side of trawl winch, collar is fastened to axle of winch, but can be unhinged for normal operation. Lining, similar to auto brake lining, is fitted tightly around axle. Variation of strains coming from towing lines is transmitted through the winch axle to the bearings in the collar, and then to the spring of the dynamometer. Voltmeters then register strain.
- (C) Hook on ends of dynamometer are hooked to special attachment running from winch to deck--see (B). Any change in strain on towing lines around the winch is registered by the two voltmeters--see (D).
- (D) Device can also be fitted to winches of limited capacity as shown.



Japan

TUNA EXPORT QUOTAS FOR 1959 SET BY PRODUCERS' ASSOCIATIONS:

In preparation for the beginning of a new export year on April 1, 1959, Japanese tuna industry associations held a series of meetings to set export production quotas and check prices, and to decide the terms of allotment of the quotas among their members.

The Export Tuna Cannermen's Association has decided on a total production quota of canned tuna in brine for export to the United States of 2,450,000 cases, with a possible increase of another 10,000 cases. This increase of about 25 percent over the 1958 export quota of 2 million cases reflects the rise in the United States canned tuna pack and consumption.

The Export Tuna Freezers' Association has set its production quotas for United States exports and the division of production between vessel-frozen and

shore-frozen fish. The quota for albacore is 29,700 tons, of which 2,910 tons can be frozen aboard fishing vessels and 1,590 tons aboard motherships. Exports of tuna loins will be limited to 2,970 tons, at minimum prices of \$730 for albacore and \$565 for yellowfin. Export production of frozen yellowfin has been divided on the basis of 35,000 tons for freezers in Japan shipping by freighter and 120 landings for fishing vessels delivering fish directly in foreign ports (Atlantic fishery). The vessels will be under the further limitation that no vessels may make more than two such landings for export to the United States within one year. It has been estimated that 120 clipper landings will represent between 35,000 and 40,000 tons of tuna. Check prices per short ton for frozen yellowfin have been set at \$190 for large, \$210 for medium, and \$220 for small fish.

The Freezers' Association has decided to set its 1959 broadbill swordfish production quota at 4,455 tons, down slightly from last year's 5,000 tons because of slow sales.



Frozen tuna at Tokyo Wholesale Fish Market. The fish have been landed from the 300-ton tuna long-liner at the dock. Tuna were caught in the Indian Ocean.

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Japan (Contd.):

TUNA MOTHERSHIP OPERATIONS AND RESEARCH:

Licensing policies for Japanese tuna mothership operations for 1959 were announced on April 8, 1959, by the Fishery Agency. The basic production limit for the tuna mothership fishery in 1959 will be 13,600 metric tons, but this limit may be exceeded by as much as 9,300 tons if some of the participating fishing companies agree to lay up their vessels for corresponding periods during the rest of the year. Since the operating plans of the principal companies engaged in this fishery, as reported by the trade press, already exceed this limit, the Fishery Agency is faced with the task of apportioning the production quota among license applicants in accordance with their past production records.

On April 4, the Fishery Agency issued a significant directive aimed at strengthening and coordinating the activities of the research vessels, fisheries guidance vessels, and training ships which various local governments are using to fish for tuna. Noting that the number of such vessels has increased rapidly in recent years, and now totals more than 40, the directive states that, if they are used primarily to earn income, there is a danger that they will have the effect of economically oppressing commercial tuna fishermen. The directive prescribes a very broad program of standard observations, including keeping of fishing records, collection of biological specimens, tagging, morphometric measurements, scale and blood samples, and larval fish collection. The data and specimens will be kept and processed by the Nankai Regional Fisheries Research Laboratory. The result should be a great strengthening of tuna research in Japan. (United States Embassy, Tokyo, April 1, 1959.)

ALBACORE TUNA FISHING SLOW IN DEVELOPING:

According to an early April report issued by the Fisheries Research Team of Takai University, the water temperature around the usual albacore fishing ground stretching southeasterly from Japan's mid-Honshu had dropped slightly from the last 10-day period.

Hidden in the main cold water mass are thick groups of small as well as medium- and large-sized albacore and on March 26 a school of 24-pound albacore mixed with yellowfin and skipjack was seen to rise to the surface. Act of rising up near the surface is done usually at daybreak and just before sunset. The general pattern of water mass formation looks quite similar to last year.

As for an immediate outlook, waters within 30°-31° N., 133°-135° E., in the offing of Shikoku have a greater probability of containing small- and medium-sized fish schools rising up to the surface. Catches after the first 10-day period of April should exceed the actual result achieved last year, according to the prediction.

PRICE CUT ON CANNED WHITE MEAT TUNA IN BRINE:

Provisionally the Japanese Tuna Packers' Association Directors on April 15, 1959, decided to recognize a \$1.00 per case cut in the price of white meat tuna canned in brine sold to the United States for the next, or 5th, "sale period" only. Prices for lightmeat tuna remained unchanged.

For the 4th "sale period," total exports of 350,000 cases are expected by the packers, of which albacore would be 250,000 cases. Packers are reported paying about \$300 a short ton ex-vessel for albacore tuna. However, if albacore landings continue light, the cut in price will probably be reconsidered.

REDUCED PRICE STIMULATES SALES OF TUNA LOINS:

According to a Japanese newspaper report on March 5, 1959, the reduced check prices of US\$730 (formerly \$850) a ton for albacore loins and \$565 (formerly \$620-640) for yellowfin tuna loins have resulted in increased sales to the United States. The former check prices for tuna loins were fixed when market conditions were favorable, but under the weaker market of the past few months those prices were too high and sales lagged.

Japan (Contd.):

Due to the slow market for tuna loins since the first of the year, trade sources predicted that it would be difficult to dispose of the entire 3,000-metric-ton quota before the end of the fiscal year ending March 31, 1959.

**EXPLORATORY TUNA FISHING
VESSEL REPORTS GOOD CATCHES
OFF GALAPAGOS ISLANDS:**

The Japanese pelagic fisheries guidance vessel Iwaki Maru from Fukushima Prefecture was due back in Misaki the latter part of March from its trip to the eastern Pacific. The vessel left Japan for its third trip during December 1958.

The vessel reported that upon arriving at the fishing grounds off the Galapagos Islands (123° 18' W. long. and 6° 25' S. lat.) the first long-line set yielded 28 yellowfin and 5 big-eyed tuna, 47 large bonito, 20 broadbill swordfish, and 4 striped and black marlins--total weight 5.3 metric tons. Following the first set, catches averaged 5.6-6.5 tons or about twice what was obtained during the vessel's second trip. It was expected that the vessel would have a full load of 236 tons by early March and be on its way back to its home port two or three weeks ahead of schedule.

**NORTHWEST PACIFIC SALMON
FISHERY QUOTA FOR 1959:**

A quota of 85,000 metric tons of salmon has been set by the International Northwest Pacific Fisheries Commission for the 1959 Japanese mothership salmon fishery. The quota is 23 percent below the quota of 110,000 tons in effect for the 1958 season and about 29 percent under the quota of 120,000 tons in effect for 1957. The quota agreement was reached on May 13, 1959, after nearly four months of negotiations between the Japanese and Russian delegates to the Commission. The original request by the Japanese at the start of the negotiations was for a 165,000-ton limit with the Russians countering with an offer of a 50,000-ton limit.

Acceptance of the reduced quota by the Japanese is going to mean a heavy blow to those directly and indirectly concerned with the Japanese Northwest Pacific high-seas salmon fishery, according to a spokesman for the Japanese Federation of Salmon Fishing Cooperatives.

**PLAN TO CAN PET
FOOD FROM FISH WASTE:**

Japanese high-seas salmon packers are planning to pack pet food from waste salmon at their land processing establishments this season. Reports indicate that there is an increasing demand from the United States for Japanese canned pet food. Also, a number of Hokkaido fish canners have now begun to plan packing of pet food from such fish as saury, herring, Atka mackerel, etc., as may be caught locally. It is even said that some sample lots have already been canned by a few canners who hope to get into mass production in the future. The major fishery items canned in Hokkaido are pink salmon, king crab, Kegani crab, Hanasaki crab, saury, squid, scallop, clam, and whale meat.

**WHALE MEAT SOLD TO
UNITED STATES FOR PET FOOD:**

A contract sale of 1,000 metric tons of Antarctic whale meat for use in canned pet food was announced in mid-April by a Japanese company. The price of the sale was \$240 a ton c.i.f. New York City. Another Japanese company is reported negotiating a similar sale.

**FISH SAUSAGE DEMAND
REFLECTS CHANGING FOOD HABITS:**

Changing food preferences are bringing a boom to the Japanese manufacture of fish sausage and similar products. Figures released by the Japan Fish Sausage Manufacturers' Association indicate that production of conventional types of fish sausage and "ham" was up to 49,190 metric tons in 1958, as compared with 38,217 metric tons in 1957, and a further increase of at least 20 percent is being predicted for 1959. Since the fall

Japan (Contd.):

of 1958, the manufacturers have been busy introducing new products, such as "salami," "sliced ham," and "corned beef," and although production statistics seem to be lacking for those exotic items, they are also expected to develop greatly during 1959.

Competition is keen among the manufacturers of the new foods, principally the three or four largest marine products companies in Japan, and the effect of the fish sausage boom is also seen on competing food products. Last year, fish sausage and ham production nearly equaled that of meat sausage and ham, and it will probably surpass the latter in 1959. The popularity of these handy, relatively imperishable foods is also said to be holding back expansion of demand for fresh fish.

A comparison between Japanese consumption of marine products during 1948 and 1958 reflects the change in demand. Taking 1948 consumption as 100, the 1958 indices for the following foods are: fresh fish 112, salted and dried fish 153, refrigerated products 268, and whale meat 460 (United States Embassy in Tokyo, May 1, 1959.)

CANNED SARDINE PRICE TO WEST AFRICA CUT:

A cut of 28 cents a case was recently made by the Japan Canned Fish and Shellfish Sales Company for sales to West Africa of small No. 1 type canned sardines. West Africa, before 1958, purchased about 150,000 cases of Japanese canned sardines, but recently South African sardines have cut into the sales of Japanese sardines to that area. In 1958, exports of canned sardines from Japan to West Africa were only about 50,000 cases. Therefore, in an attempt to bolster sales to that area, the Japanese announced the cut in price.

CANNED SAURY PACK TARGET REDUCED:

As much as 640,000 cases of canned saury were in stock as of the first part

of April and only 340,000 cases were expected to be moved by the end of August, according to a report of a meeting of the Japan Export Canned Saury Manufacturers Association on April 13, 1959. At first the Association was planning on a pack target of about 650,000 cases, but because of the unsold stocks on hand it is planned to reduce the target to 600,000 cases for the new pack season.



Korea

INCREASE IN EXPORTS OF FISHERY PRODUCTS PLANNED:

The Republic of Korea trade program for the second half of 1959 includes an estimated US\$4.6 million in exports of fishery products. The planned exports of fishery products include \$570,000 of frozen shrimp. Considerable interest in Korean shrimp supplies has developed in the United States and this item may become a substantial source of foreign exchange in the future.



Mexico

MERIDA SHRIMP FISHERY TRENDS, MARCH 1959:

The Mexican shrimp fishing industry in the Campeche and Ciudad del Carmen areas of the Gulf of Mexico has declined to the point of crisis due to small catches, lower prices on the world market, and increased costs of operation. The small catches are believed to be due in part to natural causes, but they may also be the result of past fishing practices, particularly the heavy catches of small immature shrimp.

Increased costs of petroleum, oil, and repairs have forced some boat owners, whose margin of profit is at best quite low, to tie up their vessels, thus leaving idle fishermen who must seek economic assistance from the cooperatives.

Representatives of the various sectors of the shrimp industry assembled to consider means of combating the problem and adopted a program which would ban catches of small shrimp and

Mexico (Contd.):

forbid their purchase by the cooperatives, declare white shrimp out of season for three months, and work toward a strict control of fishing throughout the Gulf of Mexico, the latter presumably contemplating action at the diplomatic level. (United States Consul dispatch of April 3, 1959, from Merida.)

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VOLUNTARY CLOSED SEASON FOR SHRIMP FISHING IN CAMPECHE AREA:

The fishermen's cooperatives and the shrimp industry of Ciudad del Carmen and Campeche, Mexico, have agreed on a two-months (April 1 to May 31) closed area which extends out into the Gulf of Mexico nine miles. The agreement, which was reached on March 31, includes penalties and the boat crews are required to sign a copy of the agreement. The agreement also bans the catch or purchase of shrimp smaller than 50 to the pound heads on. The penalties and rules are:

1. Three months suspension for the crews of ships caught fishing within nine miles of shore.
2. Permanent suspension in case of repetition.
3. For capture or transport of white shrimp (*Penaeus setiferus*), confiscation of the catch and the penalties mentioned above.
4. If a boat owner desires to force the crew to fish within nine miles, he must do so in writing. The same penalties will be applied to the ship and the owner will be obliged to maintain the crew during the penalty period.
5. Any company buying or found having white shrimp in possession will be penalized as follows: (a) confiscation of the shrimp; (b) expulsion from the National Chamber of the Fishery Industry; (c) request to the authorities to close the plant.
6. The cooperatives will not issue certificates for white shrimp during the closed period. (According to Mexican law legal transactions involving shrimp must be accompanied by a certificate from a fishing cooperative.)
7. The Chamber, the cooperatives, and the authorities will undertake the enforcement and any ship caught within nine miles will have the penalties applied automatically without recourse.
8. The Chamber, cooperatives, and the authorities will, upon termination of the closed season, send ships to determine whether the closed season should be extended or not.

The Ciudad del Carmen-Campeche area in the Gulf of Mexico has been suffering from low catches of shrimp since the fall of 1958. The closed season is an attempt to prevent the capture of small white shrimp and to increase catches later on. However, since practically the entire range of the adult white-shrimp population is involved in the closed area, the results of the closed season may not be those anticipated by the proponents of the measure. Depending upon the recruitment rate of small shrimp and growth and natural mortality rates the area could wind up inhabited by a smaller total poundage of shrimp at the end of the closed season than at the beginning.

In any event, the measure, if complied with, should eliminate shipments of white shrimp from this region to the United States for two months. Normally, on an annual basis, about one-third of the Ciudad del Carmen landings are white shrimp whereas the Campeche landings are composed of a small percentage of whites.

The Mexican shrimp industry not only in the Carmen-Campeche area but elsewhere in the Gulf of Mexico is in a

very distressed condition because of light catches. The industry is further plagued by rising costs of operation.

Shrimp landings for the first quarter of 1959 in the Campeche-Carmen area totaled 2.8 million pounds heads on as compared to 4.7 million pounds the same quarter in 1958.

Shrimp landings for the first quarter of 1959 in the Campeche-Carmen area totaled 2.8 million pounds heads on as compared to 4.7 million pounds the same quarter in 1958. (United States Embassy dispatch from Mexico dated April 3, 1959.)



Morocco

FISHERY PRODUCTS LANDINGS AND FOREIGN TRADE:

Landings of fish and shellfish in Morocco (includes both Northern and Southern Zones) during 1957 were about 142,776 metric tons, a record for recent years. The 1957 landings were greater than in 1956 by about one-third. Landings were curtailed at the height of the season due to lack of buying interest on the part of the fish canners. The market for canned fish was depressed, but demand was good for fish meal. Although the fish meal manufacturers could have utilized surplus sardine catches for fish meal, they were prevented from buying the surplus because the fishermen's labor union, would not allow the vessels to sell fish unwanted by the canners at the lower price offered for fish for reduction into fish meal.

With a large stock of canned sardines unsold from 1957, the outlook was not bright for the canning industry in 1958.

Landings in 1957 included 109,828 tons of sardines, 9,373 tons of tuna, 22,734 tons of other finfish, and 841 tons of shellfish. The canning industry consumed 70,630 tons of sardines and 6,856 tons of other fish; the reduction plants used 31,276 tons; 21,776 tons were sold for human consumption; 6,684 tons were frozen for export; and the balance used for bait, salting, and unspecified purposes.

Morocco's production of processed fishery products amounted to 70,438 tons--canned sardines 27,089 tons, canned tuna 17,401 tons, other canned fish

Morocco (Contd.)

Table 1 - Morocco's Exports ^{1/} of Fishery Products, 1957									
Product	France	West Germany	French West Africa	Italy	British African Territories	United States	Algeria	Other Countries	Total
(Metric Tons)									
Sardines:									
Canned	10,661	2,890	2,050	1,709	1,661	313	-	5,755	25,039
Fresh	4,979	-	13	61	-	-	60	3	5,116
Frozen	3,581	-	-	-	-	-	411	-	3,992
Salted	648	-	-	-	-	-	37	42	727
Total Sardines	19,869	2,890	2,063	1,770	1,661	313	508	5,800	34,874
Tuna:									
Canned	888	-	28	-	-	-	140	143	1,199
Fresh	504	-	-	6	-	-	-	26	536
Total Tuna	1,392	-	28	6	-	-	140	169	1,735
Other fresh fish	333	-	5	144	-	-	2,712	611	3,805
Shellfish, frozen or fresh	181	-	-	299	-	-	129	4	613
Shellfish, canned	50	-	-	16	-	-	3	4	73
Other, dried and salted	94	9	-	-	-	-	38	24	165
Mackerel, canned	774	-	-	60	-	-	260	27	1,121
Fish meal	2,944	2,712	-	285	-	3,482	-	3,278	12,701
Fish oil ^{2/}	1,699	161	-	23	-	-	-	215	2,098
Other canned	-	-	-	-	-	-	-	14	14
Totals	27,336	5,772	2,096	2,603	1,661	3,795	3,790	10,146	57,199

1/ Southern zone only.

2/ Includes cod-liver oil.

663 tons, salted fish 1,597 tons, frozen fish about 5,000 tons, fish meal 12,764 tons, fish oil 2,927 tons, and fertilizer 2,997 tons.

Exports of fishery products from the southern zone of Morocco in 1957 totaled 57,199 tons. France was Morocco's best customer and accounted for 47.8 percent, or 27,336 tons, of the total exports. The United States purchased about 4,795 tons--3,482

tons of fish meal and 1,313 tons of sardines.

Imports of fishery products by Morocco in 1957 totaled 1,677 tons, and included 1,618 tons of fresh fish, 295 tons of salted fish, 354 tons of shellfish, and 10 tons of salmon and other products. The United States share of Morocco's imports of fishery products was only about 7 tons of canned salmon. (United States Embassy in Casablanca, November 10, 1958.)

Mozambique

PORTUGUESE-AMERICAN
COMPANY TO FISH FOR
SHRIMP AND SPINY LOBSTER:

A new fishing company formed with Portuguese and American capital (about US\$105,000), with headquarters in Lourenco Marques, Mozambique, was scheduled to start fishing for shrimp and spiny lobsters about July 1. Late in May the company was waiting for the delivery of two fishing vessels from the United States, and later on additional boats will be added to the fleet.

A contract has been signed by the new company with the Mozambique railroad administration for the use of a large part of the only refrigerated warehouse in Lourenco Marques. In the initial stages,

plans call for the sale of shrimp and lobsters to Mozambique and neighboring territories. Later, when space becomes available on reeferships, the firm expects to export shrimp and spiny lobsters to the United States.

All individuals or firms interested in entering commercial fishing ventures in Mozambique must be licensed by the Government. All licensed fishermen are required to report their catches to the Port Captain, who attempts to regulate the licensing of fishermen in order to avoid oversupplies in the markets.

Commercial fishery statistics on the landings of fish and shellfish in the fishing ports of Mozambique are difficult to obtain. During 1956, the latest year for which statistics are available, fish

Mozambique Contd.):

entering those ports amounted to 5.9 million pounds; shellfish, 0.6 million pounds; shrimp, 0.6 million pounds; and unclassified or other fishery products, 0.2 million pounds. The principal port was Lourenco Marques where about 57 percent of the total fish and shellfish was landed.

(United States Consulate dispatch of May 20, 1959, from Lourenco Marques.)

cans/cs., \$4.27. Peru: bonito, light meat in cottonseed oil, solid pack, 7-oz., 48 cans/cs., \$6.30; 3½-oz., 48 cans/cs., \$3.92 a case.

Importers state that there is very little demand for canned tuna in Holland and that a large part of the purchases are re-exported. Consumers prefer the solid pack light meat canned tuna, a United States Embassy dispatch (May 12, 1959) from the Hague states.



Netherlands

UNITED STATES CANNED TUNA PRICED TOO HIGH TO MEET COMPETITION:

According to a Netherlands importer, Japan and Peru are practically the only suppliers of canned tuna to the Netherlands. Wholesale prices quoted c.i.f. Rotterdam late in April for Japanese and Peruvian canned tuna were: Japan: white meat, solid pack in oil, 7-oz. cans, 48 cans/cs., US\$7.00-7.50 and in 3½-oz. cans, 48 cans/cs., \$4.00-4.50; light meat in oil, solid pack, 7-oz. cans, 48 cans/cs., \$6.00 and 3½-oz. cans, 48 cans/cs., \$3.00-3.50; Peru: light meat, solid pack in oil, 7-oz. cans, 48 cans/cs., \$6.00.

One of the leading brands of canned tuna on the Netherlands market is produced by the Peruvian subsidiary of a large California tuna cannery. As of the end of April the Peruvian subsidiary was reported unable to make offers for shipment to the Netherlands because canned tuna stocks from the 1958/59 catch were about exhausted. The latest offer from the Peruvian firm (April 15) for solid-pack tuna in oil was \$5.80 (probably f.o.b. Peru) a case of 48 7-oz. cans, the United States Consul at Rotterdam reported on April 29.

IMPORTED CANNED TUNA PRICES, MAY 1959:

The following imported canned tuna prices c.i.f. Netherlands were reported by import trade sources early in May 1959. Japan: light meat tuna (skipjack or yellowfin) in cottonseed oil, solid pack, 7-oz., 48 cans/cs., US\$7.21; 3½-oz., 48

Norway

LOFOTEN AREA COD LANDINGS HIGHER IN 1959:

Reports from North Norway indicate that the 1959 cod fisheries in the Lofoten waters produced more fish and better earnings than in several years, despite record-low participation. The season was officially called off April 24, marking the departure of inspectors and fishermen alike. Between 9,000 and 10,000 fishermen took part in this year's venture on the Lofoten banks spawning grounds of the mature Arctic cod.

The total catch was 44,177 metric tons, which exceeded the 1958 quantity by about 11,000 tons. Largest landings were made by vessels operating out of Henningsvåg and Svolvær. First-hand value of the catch is estimated at some Kr. 44 million (US\$6,160,000). Earnings per fisherman for the 3-months season ranged from Kr. 4,000 to Kr. 8,000 (US\$560-\$1,120).

According to a Tromsø newspaper, the result was fairly satisfactory. Fishermen using jigs and hand lines did especially well. For a while, though, rough weather forced vessels to stay in port many days. Storms also caused extensive loss of gear. (*News of Norway*, May 7, 1959.)

COD FISHERY TRENDS, APRIL 1959:

Landings of spawning and spring cod as of April 18, 1959, in the Troms and Lofoten areas of Norway amounted to 100,551 metric tons. (As of April 24

Norway (Contd.):

spawning cod landings in the Lofoten area were reported to be 44,177 tons.) The landings through April 18 were substantially higher than the 89,813 tons landed in the same period of 1958.

Of cod landings from Troms and Lofoten, 64,270 tons were sold for drying, 15,293 tons for salting, and 20,088

tons for the filleting, freezing, and fresh trade.

The vessels fishing out of Møre og Romsdal and Sogn og Fjordane started long-line fishing on the deep-sea banks. Heavier landings of ling, cusk, and halibut are expected from those operations, the Norwegian fisheries periodical Fiskets Gang reported on April 23, 1959.

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SHIP FRESH FISH BY AIR:

In Aelesund--one of Norway's leading fishery centers--a new airport has recently been put into service. Lobsters, salmon, sea trout, oysters, etc., are shipped daily by plane more than 300 miles to Oslo to be consumed just a few hours after capture.

The airline operating between Aelesund and Oslo was established after extensive research into the fish-freight possibilities. The fishermen's associations that are making aerial fish shipments are especially interested in the success of the airline. (Industrias Pesqueras, Vigo, Spain, February 1, 1959.)



Panama

PINK SHRIMP FAIL TO APPEAR FOR SECOND TIME:

The Panamanian pink shrimp (*Penaeus brevirostris*) fishing season (usually starts in February or March) failed to materialize for the second straight year. In spite of the perfect setting of cold water (down to 70° F.), strong northeasterly winds and no rains, pink or "rojo" catches were extremely spotty and the total take was as low if not

lower than in 1958. White shrimp, however, have appeared this year before the beginning of the rains and are quite plentiful, but the catches have a high percentage of small immature shrimp. A proposed basic law for regulating the shrimp industry is under consideration.

The Taboga fish meal plant now has three purse seiners fishing with an average daily take of 60 tons of fish, primarily anchovetta. (United States Embassy, Panama, report of April 21, 1959.)



A fleet of shrimp trawlers at the pier of a Panamanian fishery company.

~~SECRET~~

Peru

BONITO AND ANCHOVY CATCHES LOWER IN CHIMBOTE AREA:

Scarcities of anchovy and bonito in waters off Chimbote, Peru, have caused an increase in prices of Peruvian fish meal and canned bonito. The pack of canned bonito in 1958 amounted to about 600,000 cases--one third of the 1956-1957 pack. A recent survey showed that Chimbote's fish meal plants and bonito canning factories are operating at only 20-25 percent of capacity.

The fishery for anchovy to be used in fish meal manufacture has been good in the cold waters north and south of Cal-lao. However, due to the long distance, fish from there cannot be shipped to Chimbote because it spoils en route. (Industrias Pesqueras, Vigo, Spain, March 15, 1959.)

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EXPORTS OF PRINCIPAL MARINE PRODUCTS, 1957-1958:

Expanding exports of fish meal at satisfactory prices continued to make the Peruvian fisheries industry one of

the bright spots in the economy. The value of fish meal exports in 1958 exceeded that of zinc or gold, and is expected to be higher in 1959. Most fish meal exports are to non-United States destinations. Peruvian suppliers have contracts to supply West Germany with fish meal needs for the first half of 1959 up to about US\$5 million.

Products	1958	1957
	(Metric	Tons)
Canned bonito	12,541	17,857
Fish meal	105,777	61,645
Frozen tuna	9,808	6,634
Frozen skipjack	6,073	5,337
Sperm oil	7,352	4,435

Shipments of frozen tuna and skip-jack to the United States increased 32.7 percent in tonnage from 1957 to 1958. Catches of tuna continued to be good in the first quarter of 1959. Two United States-owned operating companies in Peru had 13 United States flag vessels fishing for tuna out of Peruvian ports during most of the first quarter of 1959 and 5 more vessels are expected, according to a April 27, 1959, dispatch from the United States Embassy in Lima, Peru.



Fishermen put their boats into the water from the beach of the small bay north of Huarney, Peru. Lima receives a large percentage of its supply of fresh fish from this type of fishing.

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Poland

MOTHERSHIP EQUIPPED WITH HELICOPTER-LANDING DECK AND ALL FACILITIES:

Polish herring drifters are now attended by a mothership, which has been constructed to provide the fishermen with all they need during work and leisure while on the fishing grounds.

Not only does she store the fish in refrigerated holds, supply the drifters with fuel and oil, water, salt, and barrels, and make repairs, but she is fitted with surgery and hospital facilities, a cinema and lecture room, and a library. She also has tailor, shoemaker, and barber shops.

In addition the use of a helicopter in times of emergency when rough weather precludes ordinary means of transfer, has been provided for by a special helicopter-landing deck on the poop.

A second auxiliary vessel operating with the drifter fleet carries the fish back to the home port.

A typical Polish mothership with the fishing fleets is about 470 feet long, with a speed of 13 knots, and a crew of 261.

Smaller fishing vessels such as drifters often experience great difficulty in mooring alongside bigger ships, risking the danger of severe damage by collision in rough seas. To meet this contingency the Polish mothership's hull has been strengthened by thicker plating along the waterline. When the drifters, loaded with herring, come alongside to unload their catch or load up with water and other necessities, four vessels can be accommodated at a time--two on each side of the mothership.

Her lifting capacity is greatly increased to facilitate the various deck operations needed to handle big catches of herring. This equipment includes six derricks around the foremast, including two side derricks and one 25-ton derrick. There are two 5-ton derricks forward of the forecastle, and two of three tons aft of the forecastle. The poop mast also has another four 5-ton derricks.

Economy in manpower has been achieved by installing electric-driven cargo winches, so that one man can control two winches--essential for swift and efficient lifting operations to the various decks.

Four electric capstans, each of three tons pulling power, are installed, and the two-shaft propelling plant has two propeller units, reciprocating engine, exhaust steam turbine, and two atmosphere water-tube boilers.

The steam turbine engines are reversible, and have two low-pressure and two high-pressure cylinders. Total output is 5,000 i.h.p. at 120 r.p.m. Electric power is generated by four steam turbine generator sets of 250 k.w. each.

Adequate supplies of drinking water for the drifters' crews are ensured by the use of two evaporators, which also supply water for the boilers. The speedy transfer of fresh water, fuel, and lubricating oil from the mothership to the drifters is facilitated by a set of pumps linked with the respective store containing these essential daily needs.

The hold of the mothership where the fish is stored until it can be transferred to the carrier vessel is cooled by refrigerating machinery, situated on the first tweendeck near the main propelling plant. This is of a compressor type arranged for direct cooling of the holds by a system of brine coils. The three compressors ensure the cooling of five holds 32° F. Two ammonia compressors are installed for cooling the provision store on the upper tweendeck. Special barrel conveyors have been provided for loading both upper and lower holds.

During loading operations at sea it is often necessary for the mothership to operate in deep water, and she has been provided with special deep anchoring, capable of a depth of 1,300 feet and additional to the normal bow and stern anchor equipment. This deep anchoring consists of a special davit, an anchor, a steel chain cable, and a cable stopper.

The drifters can be supplied with fuel, oil, and water at four different points of the mothership, and the problem

Poland (Contd.):

of mooring at sea has been solved by special floating and vertical fenders which hang down the sides of the ship. (The Fishing News, April 10, 1959.)



Portugal

CANNED FISH EXPORTS,
JANUARY 1959:

Portugal's exports of canned fish during January 1959, amounted to 3,476 metric tons (189,000 cases), valued at US\$1.8 million as compared with 3,078 tons, valued at US\$1.8 million for the same period in 1958. Sardines in olive oil exported during January 1959 amounted to 2,371 tons, valued at US\$1.2 million.

Portuguese Canned Fish Exports, January 1959		
Species	January 1959	
	Metric Tons	US\$ 1,000
Sardines in olive oil	2,371	1,206
Sardine & sardinelike fish in brine . . .	70	15
Tuna & tunalike fish in olive oil . . .	160	108
Anchovy fillets	344	237
Mackerel in olive oil	448	209
Other fish	83	29
Total	3,476	1,804

During January 1959, the leading canned fish buyer was Italy with 695 tons (valued at US\$351,000), followed by Germany with 562 tons (valued at US\$289,000), United States with 415 tons (valued at US\$283,000), Great Britain with 354 tons (valued at US\$171,000), and Belgium-Luxembourg with 282 tons (valued at US\$139,000). Exports to the United States included 200 tons of anchovies, 45 tons of tuna, and 162 tons of sardines. (Conservas de Peixe, March 1959.)

CANNED FISH PACK, JANUARY 1959:

The total pack of canned fish for January 1959 amounted to 2,359 metric tons as compared with 2,560 tons for the same period in 1958. Canned sardines in oil (1,557 tons) accounted for 66.0 percent of the January 1959 total pack, lower by 20.6 percent than the pack of 1,960 tons for the same period of 1958, the March 1959 Conservas de Peixe reports.

Portuguese Canned Fish Pack, January 1959		
Product	Quantity	
	In Metric Tons	In 1,000 Cases
In olive oil:		
Sardines	1,557	81
Sardinelike fish	1	-
Anchovy fillets	597	60
Tuna	136	4
Mackerel	2	-
Other species	66	3
Total	2,359	148

Note: Values unavailable.

FISHERIES TRENDS, JANUARY 1959:

Sardine Fishing: During January 1959, the Portuguese fishing fleet landed 4,051 metric tons of sardines (valued at US\$341,565 ex-vessel or about \$84.30 a ton).

Canneries purchased 52.7 percent or 2,133 tons of the sardines (valued at US\$185,496 ex-vessel) or about \$86.90 a ton) during January. Only 25 tons were salted, and the balance of 1,893 tons was purchased for the fresh fish market.

Other Fishing: The January 1959 landings of fish other than sardines were principally 6,441 tons of chinchards (value US\$207,409). (Conservas de Peixe, March 1959.)

EFFECT OF EUROPEAN COMMON
MARKET ON FISH CANNING INDUSTRY:

The Portuguese fish canners have expressed the view that the European Common Market is a bad omen for the fish canning industry, especially if Morocco should join this group or become associated with a Free Trade area because of its special relationship to France. Several important canners reaffirmed their industry's fear of Moroccan competition and pointed out that there had been an increase of exports of fresh Moroccan sardines to France for canning in the latter country. It was pointed out that the six Common Market countries consumed from 50-60 percent of total Portuguese sardine exports and loss of this market to Morocco would have a serious effect on the industry. Most sources felt that sales to the United States could be increased, provided that the industry

Portugal (Contd.):

greatly reduced the great number of brand names and invested more heavily in advertising in the United States.



Singapore

MARKET FOR CALIFORNIA SARDINES:

Prior to 1952 California sardines (pilchards) enjoyed a substantial market in the Singapore area and most of the

Table 1 - Singapore's Imports of Canned Sardines and Pilchards by Country of Origin and Value, 1958			
Product & Country of Origin	Quantity	Value ^{1/}	
		M\$1,000	US\$1,000
Sardines:	Long Tons		
Union of South Africa	900	1,084	354
Japan	80	86	31
Norway	18	62	20
Portugal	12	25	8
Canada	11	26	8
Netherlands	4	5	1
United States	3	9	3
Other	4	11	3
Total Sardines	1,032	1,318	428
Pilchards:			
Union of South Africa	2,109	2,439	798
Other	1	1	2/

^{1/}Values converted at rate of M\$3.055 = US\$1.
^{2/}Value less than US\$500.

shipments were made through Singapore. After the failure in catches of California sardines during the period 1952-57, Singapore importers of sardines established trading contacts with suppliers in South Africa and Japan. Currently importers in Singapore have committed themselves to these packers for supplies and the immediate prospects for increasing sales of California pilchards are not bright. However, it is believed that a sales promotion campaign could do much to re-establish the California packers' position in this market. Certain developments have taken place which may prevent the development of the market through Singapore to regain its pre-1952 level. An important factor is the existence of a customs duty of 25 percent in the Federation of Malaya on non-Commonwealth pilchards as compared to an imperial preferential duty of only 10 percent. Another factor is the gradual development of direct trading channels in many of the markets previously supplied from Singapore.

During the five-year period of 1954-58 the average annual quantity of sardines and pilchards retained in Malaya was about 2,359 long tons of which approximately 90 percent were consumed in the Federation of Malaya and the remainder in Singapore. During the same period average annual exports to surrounding areas (excluding the Federation) amounted to 1,437 long tons. According to reliable sources about 55 percent of total imports of sardines and pilchards into Malaya are consumed in the Federation of Malaya.

There are no figures showing inventories of pilchards and sardines held in Singapore and the Federation. Market sources indicate, however, that a three months supply is normally stocked and that stocks are estimated at about 800 long tons.

Importers report that consumers prior to 1957 preferred California pilchards over any other because they tended to

be fatter and contain more oil than competitive brands. Price factors, of course, are of considerable importance and California products at the present time suffer a disadvantage because of the preferential treatment accorded South African sardines in the Federation of Malaya.

There are some prejudices against Japanese products as a result of the Japanese occupation of this area during the war, but these prejudices are rapidly diminishing and the Japanese are in a relatively favorable competitive position in the market at the present time.

It is doubtful that much of the 1958 pack of California pilchards can be placed in the area served by Singapore since most importers have already committed themselves to South Africa or Japan for supplies. Traders report that they were discouraged from placing orders with California packers because of the relatively high prices quoted, reported to be as much as US\$9.00 f.o.b. Los Angeles for ovals. Prices of California pilchards, they report, have been substantially reduced in recent weeks and more interest has been expressed in these supplies, particularly for the 1959 pack.

Importers in Singapore state that Japanese suppliers have labeled sauries and horse mackerel as sardines because of consumer preferences. At one time certain brands of South African pilchards were also labeled as sardines for shipment to markets where such labeling improved sales. The Singapore Government is now more strict about labeling requirements and has prevented such mislabeling (United States Consul at Singapore, April 10, 1959).

Table 2 - Singapore's ^{1/} Imports of Sardines and Pilchards, 1954-58			
Product	Quantity	Value	
		M\$1,000	US\$1,000
Sardines:	Long Tons		
1958	1,031	1,317	431
1957	1,942	2,437	798
1956	1,432	1,634	535
1955	714	867	284
1954	1,062	1,383	453
Total	6,181	7,638	2,501
Pilchards:			
1958	2,110	2,441	799
1957	2,639	3,131	1,025
1956	2,755	3,207	1,050
1955	3,229	3,559	1,165
1954	2,066	2,451	802
Total	12,799	14,789	4,841

^{1/}Exclusive of trade between Singapore and the Federation of Malaya.

Table 3 - Singapore's ^{1/} Exports of Sardines and Pilchards, 1954-58			
Product	Quantity	Value	
		M\$1,000	US\$1,000
Sardines:	Long Tons		
1958	1,812	2,145	702
1957	1,301	1,573	515
1956	1,452	1,696	555
1955	1,170	1,316	431
1954	995	1,115	365
Total	6,730	7,845	2,568
Pilchards:			
1958	59	71	23
1957	64	72	24
1956	74	85	28
1955	124	140	46
1954	135	152	50
Total	456	520	171

^{1/}Exclusive of trade between Singapore and the Federation of Malaya.

Singapore (Contd.):

Table 4 - Prices (c.i.f.) at Singapore April 1959 for Canned Pilchards and Competing Canned Fish Products

Table 4 - Prices (c.i.f.) at Singapore April 1959 for Canned Pilchards and Competing Canned Fish Products								
Cases	Japan				South African		California	
	Saury		Jack Mackerel		Pilchards			
	M\$/cs.	US\$/cs.	M\$/cs.	US\$/cs.	M\$/cs.	US\$/cs.	M\$/cs.	US\$/cs.
(All tomato sauce):								
48-16 oz. Oval . . .	23.00	7.53	19.05	6.24	-	-	24.70	8.09
48-16 oz. Tall . . .	21.50	7.04	18.70	6.12	22.00	7.20	21.35	6.99
96- 9 oz. Tall . . .	25.00	8.18	21.60	7.07	-	-	-	-
48- 8 oz. Tall . . .	-	-	-	-	12.70	4.16	-	-
100-5 oz. Round . .	20.00	6.55	18.50	6.06	20.80	6.81	-	-



Sweden

FISHERMEN OFFERED INSURANCE ON LING CATCHES:

The Swedish High Seas Fishermen's Sales Association in Goteborg has decided to arrange for insurance on ling catches for its members. For example, in case of engine breakdown, such a policy would give a fisherman a certain compensation for the catch which he normally would have made if the engine had not failed.

This type of insurance is of great importance to the fishermen, according to the Chairman of the Association. Vessels holding such policies will be reimbursed for oil, ice, bait, and salt expenditures and also for loss of income up to an amount of 20,000 crowns (US\$3,866) in case of a broken trip.

The interest of Swedish fishermen in ling fishing north of the Hebrides and Shetland islands has increased and 40 vessels have this year announced that they plan to participate, as compared with 30 vessels in 1958. The first boats were scheduled to leave about the end of April and some boats plan to make two trips, the United States Consul in Goteborg reported on April 21, 1959.

Ex-vessel prices are the same as in 1958 or 1.00 crown per kilo (8.8 U. S. cents a pound) for fresh ling, 0.60 crown per kilo (5.3 U. S. cents a pound) for

fresh cod, and 0.50 crowns per kilo (4.4 U. S. cents a pound) for salted ling.

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OSCILLOSCOPE AND ELECTRIC GROUND WIRE DEVELOPED AS AID TO NAVIGATION:

Navigation of a vessel along an electric wire placed on the sea bottom was recently demonstrated in the Sound between Sweden and Denmark by two Swedish inventors from Malmo, Sweden. A film of the demonstration was shown on the Swedish television circuit on May 7, 1959.

An electric wire in the form of a triangular track was laid at the bottom of the Sound and the navigator of a motor boat followed the electric wire with the assistance of an oscilloscope. The navigator operated in a closed room and had no view in any direction, thus being restricted to navigating solely with the aid of the oscilloscope and the electric wire.

When a vessel fitted with an oscilloscope is above the electric wire, an arrow on the instrument used by the navigator will point straight down. Should the vessel deviate from the wire, for example starboard, the arrow will point to the port side of the vessel, or vice versa.

This system of navigation, it is claimed, could be very useful in narrow channels and ports as well as in darkness and fog.

Sweden (Contd.):

The electric wire was connected to the ordinary Malmo city lighting system, the United States Consul in Goteborg reported on May 8, 1959.

FACILITIES FOR QUICK-FREEZING FISH EXPANDED:

The Helsingborg Cold Storage Plant in Helsingborg has opened a new large fish-filleting section which was constructed by a large Swedish fish-processing company.

The processing room has four automatic filleting machines, two of which are rented from another Swedish fish-processing company, with a total capacity of 1,500 half boxes of cod (containing 45 kilos or about 99 pounds) in 10 hours. The volume of the storage space in the plant amounts to 67,000 cubic meters and the freezing capacity for herring is about 30,000 half boxes a week.

During a recent visit of West Coast fishermen to the plant, the director of the operating company told them that his company first of all wishes to take care of fish caught by Swedish fishermen, and that imports will be limited to fish which cannot be supplied by Swedish fishermen. The director also said that the company has decided that fish more than two days old cannot be used for preparation of top-quality products.

The director also said that because of its size the new fillet section cannot be made to pay if fishing for cod is carried on for only 4 to 6 weeks, as in the Baltic at present. He raised the question whether fishing for cod in the Baltic could not start in January rather than in the middle of April.

Quick-freezing as a method of preservation is relatively new in Sweden and will therefore be subject to many improvements, according to the director of the Helsingborg plant. No one could have anticipated, he said, that quick-frozen cod fillets would have become as popular as they are today. Also, no one believes that the present system of freezing herring, which now is done relatively slowly,

with the herring in boxes containing 45 kilos, will continue in the future.

Research work at the cold storage plant regarding freezing and storage of herring deals with important problems, such as the storage fitness at different temperatures and preservation methods. Other factors, such as the freezing velocity when herring is frozen in boxes compared with freezing of herring in chunks or in various other packing material is also being investigated, the United States Consul in Goteborg reported on May 11, 1959.

FISHING INDUSTRY, 1958:

Preliminary data on the landings of fishery products by the Swedish fishing fleet in 1958 indicates a total of 215,206 metric tons (474.3 million pounds) landed at home and abroad in 1958, an increase of 6 percent as compared with 1957, when 202,100 metric tons (445.4 million pounds) were landed, but 2 percent less than the total landings in 1955 (the largest landings on record) when 219,900 metric tons were landed. The figures include fish for industrial purposes, such as used in the production of fish oil and fish meal. The latter category has during the latter years increased and represented in 1958 over 12 percent of the total landings at home and abroad.

Landings in Sweden accounted for 69 percent of the total landed and the remaining 31 percent were landed in Denmark, West Germany, and Great Britain. Compared with 1957, the quantities of fish landed in Sweden dropped by 10 percent, while the landings abroad increased by 76 percent.

The total value of the 1958 landings increased by 3 percent and amounted to 149.1 million crowns (US\$28.8 million) as compared with 145.2 million crowns (US\$28.0 million) in 1957. The value of the 1958 landings exceeded the 1955 value by 12 percent. The increase in the value of the catch in 1958 originates from landings abroad, which increased by 66 percent as compared with 1957, while the value of the landings in Sweden dropped by 6 percent.

Sweden (Contd.):

Herring landings made up 45 percent of the total catch and increased by 6 percent over 1957. Baltic herring, which made up 9 percent of the total catch in-

1957, a decrease of 10 percent. This decrease originates from the West and South Coast areas, where the landings dropped by 18 and 2 percent, respectively. The landings on the East Coast on the other hand increased by 20 percent.

Table 1 - Swedish Fish Landings by Main Species (including landings in foreign ports)

Species	Quantity		Value			
	1958 (Metric Tons)	1957	1958 (Sw. Kr. 1,000)	1957	1958 (US\$1,000)	1957
Herring and Baltic herring:						
Herring	97,112	92,028	50,350	46,029	9,718	8,884
Baltic herring	19,370	14,044	10,511	8,909	2,029	1,719
Cod	26,932	32,059	17,561	19,432	3,389	3,750
Haddock	5,987	6,832	5,717	5,903	1,103	1,139
Whiting	2,778	2,137	2,101	1,575	405	304
Ling	3,057	3,531	3,032	3,384	585	653
Other cod	5,086	6,825	4,490	5,282	857	1,019
Mackerel	13,287	11,952	9,230	7,885	1,781	1,522
Sprat	2,188	3,470	3,670	4,838	708	934
Other	1/9,113	10,223	32,754	34,274	6,322	6,615
Not specified	4,351	4,879	5,202	5,530	1,004	1,067
Industrial fish	25,945	14,118	4,452	2,159	859	417
Total	215,206	202,100	149,070	145,200	28,770	28,023

1/ Includes: flatfish 2,721 tons; eel 1,487 tons; salmon species 1,222 tons; and shellfish 3,683 tons.

creased by 38 percent, and mackerel, which comprised 6 percent of the total catch, increased by 11 percent. Groundfish species, comprising 20 percent of the total catch, decreased on the other hand by 15 percent. Sprat dropped by 37 percent and landings of eel and salmon decreased by 22 and 16 percent respectively.

The total quantity of fish landed in Sweden amounted to 148,438 metric tons as compared with 164,125 metric tons in

The total quantity of fish landed in foreign ports in 1958 by Swedish fishermen amounted to 44,583 metric tons as compared with 28,347 metric tons in 1957. Herring increased by 57 percent as compared with 1957 and made up 67 percent of the total landings abroad. The landings of herring in German and British ports dropped considerably and were slightly more than one-fourth of the landings in 1957, while the landings in Denmark increased by 185 percent. Other species landed in foreign ports

Table 2 - Swedish Fish Landings in Swedish Ports Only by Main Species

Species	Quantity		Value			
	1958 (Metric Tons)	1957	1958 (Sw. Kr. 1,000)	1957	1958 (US\$1,000)	1957
Herring and Baltic herring:						
Herring	52,529	63,681	28,016	32,156	5,407	6,206
Baltic herring	19,370	14,044	10,511	8,909	2,029	1,720
Cod	26,329	31,655	17,163	19,123	3,312	3,691
Haddock	5,287	6,057	5,221	5,373	1,008	1,037
Whiting	2,246	1,974	1,754	1,478	338	285
Ling	3,034	3,481	3,019	3,364	583	649
Other cod	4,297	6,189	3,917	4,823	756	931
Mackerel	8,416	10,060	6,317	6,930	1,219	1,337
Sprat	2,111	3,206	3,572	4,641	689	896
Other	1/9,077	9,999	32,695	33,944	6,310	6,551
Not specified	4,209	4,610	5,087	5,286	982	1,020
Industrial fish	11,533	9,179	2,143	1,318	414	254
Total	148,438	164,135	119,415	127,345	23,047	24,577

1/ Includes: flatfish 2,685 tons; eel 1,487 tons; salmon species 1,222 tons; shellfish 3,683 tons.

Sweden (Contd.):

increased even more. Cod, for example, increased by 449 percent, mackerel by 255 percent, and industry fish by 195 percent.

In terms of value, 90 percent of the landings abroad came from Denmark, 5 percent from Great Britain, and 5 percent from West Germany, as compared with 49, 24, and 27 percent, respectively, in 1957.

Swedish exports reached a new record in 1958. Sweden's exports of fish and fish products in 1958 (including direct landings) had a value of 70 million crowns (US\$13.5 million) compared with 60 million crowns (US\$11.6 million) in 1957. Direct landings in Denmark which increased in value from 8.7 million crowns (US\$1.7 million) in 1957 to 26.6 million crowns (US\$5.1 million) in 1958 were responsible for the increase. The quantity of fish landed in Danish ports rose from 21,500 metric tons in 1957 to almost 62,000 metric tons in 1958. The total value of the direct landings in all foreign ports increased from 18 million crowns (US\$3.5 million) in 1957 to almost 30 million crowns (US\$5.8 million) in 1958.

While the direct landings increased greatly last year, exports of fish and fish products from Sweden dropped slightly from 42.2 million crowns (US\$8.2 million) in 1957 to 39.9 million crowns (US\$7.7 million) in 1958. The large direct Swedish landings made Denmark the leading importer of fish and fish products from Sweden in 1958. Danish imports totaled 32.5 million crowns (US\$6.3 million) in value and thus represented almost 50 percent of the total value of Sweden's exports of fish and fish products. (It is of interest to note that the main part of the direct landings in Denmark is re-exported to other countries, chiefly West and East Germany.)

Exports to East Germany, which prior to 1958 had been the main market for Swedish fish and fish products, declined in value to 12.7 million crowns (US\$2.5 million) in 1958 from 20 million crowns (US\$3.7 million) in 1957.

Swedish imports of fish and fish products in 1958 increased by over 20 million crowns (US\$3.7 million) over 1957 and totaled 106 million crowns (US\$20.5 million). The greatest import increase consisted of frozen fish fillets, which increased by almost 50 percent in value or 13.6 million crowns (US\$2.6 million). Imports of frozen fish fillets increased in quantity by over 40 percent compared with 1957 and reached a record. More than 70 percent of the quantity of imported frozen fish fillets came from Norway in 1958 and were as great as the entire import of frozen fillets from all countries in 1957.

The average price per pound for the 1958 catch (excluding fish for industrial purposes) amounted to 6.7 U. S. cents and remained unchanged from 1957. The average price for most species was somewhat higher than in 1957; for example sprat increased from 12.2 U. S. cents a pound to 14.7 U. S. cents a pound in 1958. On the other hand the price for Baltic herring and shrimp dropped.

The average price for herring landed in foreign ports by Swedish fishermen amounted to 4.4 U. S. cents a pound, which was somewhat lower than the price received at the fish auction in Goteborg, which was about 9.8 U. S. cents a pound. Landings in West Germany brought the highest price, or an average of 5.8 U. S. cents a pound, as compared with 4.3 U. S. cents a pound in Danish and British ports. (United States Consul dispatch from Goteborg, dated May 19, 1959.)

Note: Values converted at rate of 1 Swedish kronor or crown equals US\$0.193.



Tunisia

FISHERIES LANDINGS
INCREASED SINCE 1955:

Landings of fish and shellfish in Tunisia have increased from 10,533 metric tons in 1955 to 14,937 tons in 1958. The increase has been gradual--landings of 11,607 tons in 1956 were 10.2 percent above 1955 and the 13,789 tons landed in 1957 were about 18.8 percent above 1956.

Tunisia (Contd.):

Fishing is a common occupation all along Tunisia's 812-mile coastline. The most important fishing area is the Gulf of Gabes in which Tunisia claims exclusive fishing rights out to about 27.3 fathoms (50 meters). Most fishing is carried out close to shore with simple equipment. A small sponge fishery has existed for many years out of Sfax and Djerva. (United States Embassy dispatch from Tunis, dated May 11, 1959.)



Union of South Africa

UNION OF SOUTH AFRICA AND SOUTH-WEST AFRICA
CANNED FISH PRODUCTION AND MARKETING, 1958:

Landings of pilchard (sardine) and jack mackerel (maas-banker) by the Union of South Africa's fishermen in 1958 were the best since 1952 and marked the first year since the establishment of the quota in 1952 that the 250,000-ton quota was exceeded. The South African Division of Fisheries declared the season for pilchards and jack mackerel (maas-banker) fishing closed on August 31, for the balance of the year. The season for the catching in South-West African waters was closed shortly after this date, when the 250,000-ton quota was reached. Landings in South Africa in 1958 for the canning and fish meal industries totaled 298,854 short tons as compared with 219,615 tons in 1957. Total landings were made up of 214,533 tons of pilchards (1957-118,524 tons), 62,190 tons of jack mackerel (1957-93,218 tons), and 22,131 tons of true mackerel (1957-7,873 tons). Landings for canning and reduction in South-West Africa were 257,592 tons in 1958 as compared with 254,976 tons in 1957.

Fish Canning: Fish canners in South Africa and South-West Africa reportedly paid about \$4.10s. (US\$12.60) a ton ex-vessel for pilchards, jack mackerel, and true mackerel in 1958. During the first nine months of 1958 (preliminary data) the South African fish canners packed 3,317,586 cases of pilchard, 296,098 cases of jack mackerel, and 93,885 cases of true mackerel. Nearly all canning operations had ceased by September.

Fish Meal: Preliminary estimates of fish meal production in 1958 by the Union of South Africa totaled 56,170 short tons and production in South-West Africa for the same period amounted to 46,277 tons. From January 1 to November 30, 1958, the Union consumed 19,781 tons; 35,915 tons were exported; and 4,335 tons were on hand as of that date. For the January 1- November 30, 1958, period, South-West Africa sold 1,753 tons in the local market, exported 47,566 tons, and had 6,703 tons on hand as of November 30. At the end of 1958, according to trade estimates, not more than 2,000 tons were on hand.

Fish Oil: The production of fish oil in 1958 by Union of South Africa totaled 13,392 long tons and by South-West Africa 10,751 long tons. Exports from both areas for the first eleven months of 1958 amounted to 14,356 long tons; local consumption was 8,459 long tons; and inventories as of November 30, 1958, were 3,327 long tons.

Canned Fish Exports and Inventories: Estimates for the period January 1- September 30, 1958, indicate exports of 2,138,412 cases of pilchards, 276,122 cases of jack mackerel, and 58,324 cases of true mackerel from the Union and South-West Africa. Inventories as of September 30, 1958, were 1,999,196 cases of pilchards, 18,111 cases of jack mackerel, and 8,651 cases of true mackerel. Year-end 1958 inventories were estimated to be not more than 750,000 cases. Although the pack of canned pilchards, jack and true mackerel was up about 600,000 cases in 1958 as compared with 1957, December 31, 1958, inventories were estimated to be about 200,000 cases under the quantity on hand December 31, 1957.

Canned Fish Prices: Prices f.o.b. Cape Town for canned fish fluctuated only slightly according to trade sources in South Africa. The f.o.b. prices varied according to foreign marketing area. The South African fish canners attempt to adhere closely to price quotations recommended by the South African Association of Fish Canners. The price schedules are drawn up after consultations between the individual canners and the Association.

Competitive Position and Market Prospects: South African fish canners have not thus far expressed any serious concern over the present competitive position of their products on the international market. The countries most frequently mentioned as competitors are Japan in the Far Eastern market and the Netherlands in the West African market. Of these two countries, Japan is regarded as the most serious threat. Local sources report that Japanese pilchards are generally quoted slightly higher in the Philippine market than those from South Africa. It is believed, however, that the Japanese mackerel pike or saury is offering increasing competition to South Africa. Several local exporters have nevertheless estimated that shipments to the Philippines in 1958 exceeded those of the previous year.

Table 1 - Canned Pilchard and Jack Mackerel January 1959 Prices
f.o.b. Cape Town, South Africa

Product	Cans/Cs.	For Philippines	For Malaya ^{1/}	For United Kingdom ^{2/}
..... (US\$ Per Case)				
Pilchard:				
15-oz. tall, tomato	48	6.10	7.00	6.21
15-oz. tall, natural	48	5.85	-	-
15-oz. oval, tomato	48	-	7.74	7.58
8-oz. buffet, tomato	48	4.22	-	3.96
5½-oz. jitney, tomato	100	6.04	6.74	6.58
5½-oz. jitney, tomato	48	-	-	3.28
Jack Mackerel:				
15-oz. tall, natural	48	4.95	-	-
15-oz. tall, tomato	48	-	6.44	-

^{1/} All Malayan prices less 5 percent.

^{2/} All United Kingdom prices less 2½ percent.

Union of South Africa (Contd.):

With respect to the Philippine market, South African canners consider that their most serious competitive disadvantage is presently that of delivery time. Only a monthly service presently is available out of Cape Town and transit time requires 30 days. Both the United States and Japan can offer shorter delivery dates. It may also be of interest to note that South African canners do not consider their pilchards as a serious competitor to the United States product in the Philippines. The latter product, it is reported in South Africa, is regarded as of a generally higher quality and is sought by a consumer class different from that buying South African pilchards.

Canners in the Union of South Africa appear to be uniformly optimistic that the pilchard catch in 1958 will be as good as that of 1958. There is, however, some concern

over marketing prospects in the coming year. Assuming that the total catch of pilchards, jack mackerel, and mackerel again approaches 300,000 tons, it is believed that total production of canned fish will increase further due primarily to a steady improvement in the level of efficiency in canning factories. At the present time it is estimated that on an average, from 12-13 cases, consisting of 48 1-lb. cans per case, are produced from one ton of raw fish. As canneries have been gaining experience this figure has gone up and is expected to register further improvement. Due to the early shut down in 1958, Union canners have also had more time to recondition and improve their factories.

There is no question that local canners could afford to lower their prices on the international market if such a step becomes necessary. There are, incidentally, no Government subsidies covering the export of South African fishery products. The Government does, however, participate in a vigorous and extensive fisheries research pro-

Table 2 - Union of South Africa and South-West Africa Canned Pilchard and Mackerel Pack and Distribution, January-September 1958

Product, Type of Can & Pack	Net Wt. Per Can	No. Cans/Cs.	Pack	Export	Domestic Sales	Inventory 9/30/58
Pilchards:	Oz.			(Cases)		
Ovals, tomato	15	48	105,788	79,643	10,353	40,076
Ovals, natural	15	48	-	-	-	-
Talls, tomato	15	48	680,541	488,347	47,234	517,335
Talls, natural	15	48	394,818	271,845	24,060	171,825
Oval, tomato	15	24	170,085	96,061	-	74,024
Oval, natural	15	24	-	-	-	-
Buffet, tomato	8	48	653,157	541,655	47,988	432,550
Buffet, natural	8	48	61,361	24,352	14,592	52,905
Halves, tomato	8	48	24,408	17,220	14,523	10,598
Halves, natural	8	48	7,514	2,276	5,944	1,699
Jitney, tomato	5 ¹ / ₂	100	645,022	391,971	740	352,278
Jitney, natural	5 ¹ / ₂	100	75,572	53,019	-	48,469
Jitney, tomato	5 ¹ / ₂	48	344,650	167,612	41,388	155,536
Jitney, natural	5 ¹ / ₂	48	6,169	1	7,027	98
12 oz. ¹ / ₂ , tomato	12	48	122,272	1,460	2,500	118,312
12 oz. ¹ / ₂ , natural	12	48	26,229	2,950	1,000	23,491
Totals	-	-	3,317,586	2,138,412	217,349	1,999,196
Jack Mackerel:						
Ovals, tomato	15	48	-	-	272	-
Ovals, natural	15	48	-	75	118	-
Talls, tomato	15	48	20,721	12,099	9,604	528
Talls, natural	15	48	223,217	233,395	27,192	10,729
Rounds, tomato	14	48	-	-	-	-
Rounds, natural	14	48	-	-	438	-
Buffet, tomato	8	48	1,305	473	2,561	682
Buffet, natural	8	48	107	-	100	7
Halves, tomato	8	48	14,933	2,905	12,105	1,274
Halves, natural	8	48	35,815	27,175	13,422	4,891
Totals	-	-	296,098	276,122	65,812	18,111
True Mackerel:						
Talls, tomato	15	48	3,405	3	2,362	697
Talls, natural	15	48	78,055	56,475	30,021	2,853
Halves, tomato	8	48	3,473	197	4,756	792
Halves, natural	8	48	7,952	1,648	8,633	3,959
Rounds, tomato	14	48	-	-	31	117
Rounds, natural	14	48	1,000	1	923	233
Totals	-	-	93,885	58,324	46,727	8,651
Grand Total	-	-	3,707,569	2,472,858	329,888	2,025,958

1/ New can size (used for string beans) introduced in 1958 which has not proven very successful and may be discontinued.

Union of South Africa (Contd.):

gram. As has been previously reported, Government controls do exist which limit the annual catch of pilchards and jack mackerel in the Union of South Africa and in South West Africa.

Should the industry's present optimism over fishing prospects in the current year prove well founded, total production of canned pilchards, jack mackerel, and mackerel in the Union of South Africa and South-West Africa might easily reach or even slightly exceed 4,000,000 cases.



Union of South Africa and South-West Africa

UNION AND SOUTH-WEST AFRICA FISH CATCH, 1958:

In 1958, for the first time in the history of the Southern African fishing industry, the total fish catch for the Union and South-West Africa passed 700,000 short tons. The total of 714,000 tons was more than 20,000 tons higher than the 1952 record catch of 693,688 tons. It was nearly 100,000 tons higher than the catch in 1957.

The big increase in calendar year 1958 was largely due to the good catches of pilchards, maasbanker, and mackerel off the Cape west coast. After several indifferent seasons, the 14 factories along some 200 miles of coast from Hout Bay to Thorn Bay processed 298,854 short tons of pelagic shoal fish (pilchard, maasbanker, and mackerel), compared with 219,615 tons in 1957 and 170,316 tons in 1956. The total catch was second only to the 300,560 tons landed in 1952.

Maasbanker landings of 62,190 tons compare with 93,218 tons in 1957 and 50,233 tons in 1956. The record for this fish was 130,228 tons in 1954.

The mackerel catch of 22,131 tons compares with 7,873 tons in 1957 and the record 36,927 tons in 1956.

For the fifth successive year the trawled fish catch set a new record and passed 100,000 tons for the first time. The total catch of 82,871 tons of dressed fish plus 20,570 tons of "offal" (waste after dressing fish) was 103,441 tons.

Although the spiny lobster catch of 8,000 tons was below the 14,000 tons landed in 1957, the estimated line fish and snoek catch remained at about 36,000 tons.

The South African Trawl fish catch (including offal) rose from 199,928,092 pounds in 1957 to 206,882,186 pounds in 1958. The catch (in pounds) was made up as follows (with 1957 figures in brackets): hake 137,972,319 (133,312,067), kingklip 2,662,491 (2,399,411), sole 2,325,071 (2,505,317), kabeljou 1,066,509 (1,338,546), pangas 4,461,036 (6,862,623), silverfish 238,055 (545,338), angelfish 2,725 (5,726), gurnard 591,918 (186,492), jacobever 2,120,895 (1,390,181), john dory 6,150 (86,559), maasbanker 4,569,429 (2,173,334), skate 65,585 (47,914), steenbras 6,031 (59,714), stonebass nil (13,200), stumpnose red 235,408 (75,042), stumpnose white 1,150 (91,300), heads 3,190,900 (3,290,550), shark livers 4,767,127 (3,792,267), hake livers 78,158 (555,147),

Table 1 - Union of South Africa's and South-West Africa's Shoal Fish Landings and Fish Meal and Oil Production, Fiscal Years^{1/} 1956/57-1957/58

Area	Landings Fish		Production of ^{3/}			
	Shoal ^{2/}		Fish Meal		Fish Oil	
	1957/58	1956/57	1957/58	1956/57	1957/58	1956/57
	(Short Tons)		(Long Tons)			
Union of South Africa. . .	303,135	183,592	61,746	35,553	13,667	10,207
South-West Africa. . .	257,064	245,134	46,380	44,910	10,772	9,433
Total.	560,199	428,726	108,126	80,463	24,439	19,640

^{1/} Accounting fiscal year (October 1-September 30) as used by the Fisheries Development Corporation of South Africa.

Figures different than given in text for calendar year.

^{2/} Pilchards, maasbanker or jack mackerel, and mackerel.

^{3/} Pack of canned fish not given.

The record pilchard catch of 214,533 tons, compared with 118,524 tons in 1957 and 84,156 tons in 1956. The previous highest figure for pilchards was 187,424 tons in 1952.

roes 317,614 (342,801), squid 290,493 (216,275), other fish 773,122 (475,287), and offal 41,140,000 (40,256,000).

The total Union of South Africa fish catch was, therefore, 446,295 tons, com-

Union of South Africa and
South-West Africa (Contd.):

pared with 359,879 tons in 1957, 311,429 tons in 1956, and the previous record total of 427,268 tons in 1952.

South-West Africa's Walvis Bay's pilchard industry keeps as close as pos-

2,500 tons of snoek, 2,500 tons of white-fish and about 5,000 tons of spiny lobster, the total South-West African catch was just under 268,000 tons.

The general condition of the fish landed in the Union in 1958 was such that processing results were a trifle disappointing and, as in the case of the previ-



Aboard a South African spiny lobster fishing boat at the dock prior to unloading. Boat fished in Hout's Bay area.

sible to the 250,000-ton yearly quota, although in calendar year 1958 it rose slightly above that limit to 257,592 tons, compared with 254,976 tons in 1957 and 251,047 tons in 1956. With an estimated

ous season, the optimum yields of earlier years were not achieved. Once again the main shoals were found well south of St. Helena Bay, the main center of the Union's industry. The industry based on Walvis

Union of South Africa and South-West Africa (Contd.):

Bay enjoyed another highly successful season.

The overseas demand for fish meal remained very firm throughout 1958. The poor winter herring season in Norway contributed towards this situation. Export sales were effected readily at favorable prices after the demand of the local market had been satisfied at an agreed price considerably below that obtained on foreign markets. The Union and South-West Africa occupy a very prominent position in world fish meal markets, being second only to Norway as exporters of that commodity.

The overseas demand for fish body oil did not, however, follow the same pattern, but fell considerably as a result of butter and fat surpluses in Europe. As a consequence, the average selling price per long ton of fish body oil revealed a significant drop, but the industry was able to offset this in some measure by taking advantage of the reduced rates for bulk tankers. On balance, however, producers had a satisfactory year.

While factories at Walvis Bay recorded heavy production of canned fish over the past season, the output of Union factories was limited by the condition of the fish delivered to them after a moderately long haul from the catching area. The sales of canned fish were satisfactory at profitable prices.

The demand for frozen spiny lobster remained very firm at satisfactory prices, but the difficulties in this aspect of the inshore industry lie in the catching side, where an imbalance has manifested itself as between different fishing areas. Whereas some areas reported satisfactory landings albeit at the price of greater effort, others suffered a very serious fall in catch, a development which was faithfully reflected in the accounts of the companies concerned.

Note: Also see Commercial Fisheries Review, March 1959, p. 68.



U. S. S. R.

TUNA VESSELS REPORTED FISHING NEAR CAROLINE ISLANDS:

According to a report from a Japanese tuna fishing vessel, a Russian fishing vessel was sighted fishing for tuna in the Caroline Islands area on February 17, 1959. At the time of the sighting, tuna were being hauled aboard the Russian vessel. The crew appeared to consist of about 20 persons, including some women. Another Russian vessel was reported sighted nearby.

Prior to the sighting of these Russian vessels, the Russians had announced that they might enter the Pacific tuna fishery and in October 1958 a fishery survey vessel had departed for an exploratory tuna fishing survey (Pacific Islands Monthly, March 1959).

* * * * *

EXPANSION OF OCEAN RESEARCH PLANNED:

Soviet marine scientists are to extend their ocean research activities considerably during the next few years. In 1959, two new research vessels, the Voeikov and the Shokalsky, will make their maiden voyages to the Pacific Ocean. The two new research ships were named after prominent Russian oceanographers.

The Vityaz, the largest research vessel which was engaged in oceanographic investigations in the North and South Pacific in 1958 and also visited San Francisco in November 1958, will conduct surveys in the Indian Ocean in 1959.

* * * * *

SUBMARINE RETURNS FROM FISHERY RESEARCH CRUISE:

The Soviet submarine Severyanka (The Northerner), which has been converted to conduct research for the fishing industry, returned early this year from a successful 24-day scientific cruise, having covered some 4,000 miles since leaving the Kola Peninsula. This was the submarine's second voyage. The maiden trip was undertaken in the Barents Sea following her trials.

Manning the vessel on the research side were young scientists from the U.S.S.R. Institute of Marine Fisheries and Oceanography.

The expedition established at what time of the day or night and at what depth various kinds of fish are most likely to be located. Interesting conclusions were drawn concerning the reaction of fish, particularly herring, to the sub's searchlights. It was ascertained that at night the herring were in a passive state and did not react in any way to the advance of

U. S. S. R. (Contd.):

the vessel nor to the glare of her lights. From 8 a.m. or 9 a.m., when the herring move down to a greater depth, they become increasingly active and the reaction of the fish to the electric light becomes acute.

Observations also lead to the conclusion that herring can only be caught in quantities during their vertical migration in the morning and the evening.

The Soviet Minister for Fisheries said that he believed that this venture was the first of its kind in relation to fishing. Its purpose was primarily for the solution of many problems connected with the fishing industry, such as the structure of shoals, the behavior of fish under different conditions—particularly during fishing operations; the observation of trawls and drift nets at various depths, with a view to their improvement; and extensive oceanographic readings. Other life in the sea was observed, such as jellyfish and plankton.

The Minister pointed out that while bathyspheres had their uses and were in fact already in operation, they were limited to vertical movement, were not adapted for long underwater submersion, and had to rely to a great degree upon chance as to whether anything of interest was seen. On the other hand, a submarine, such as the *Severyanka*, could actively penetrate the deep-sea world for a long period.

The *Severyanka* is equipped with underwater television for conducting researches directly ahead; echo-sounders operating upwards and downwards; instruments for taking exact measurements of the salinity, illumination, temperature, rate of flow, and the percentage of oxygen dissolved in the seawater. There are also devices for taking samples of the sea bed and the surrounding water, apparatus for underwater filming and photographing, and close-range and long-range searchlights.

The instruments incorporate all the latest techniques in radio and electrical engineering making for compactness and efficiency. Some of the instruments are newly-devised for this submarine and have not hitherto been tried—such as the dissolved hydrogen recorder, a thermosaltmeter, the silt sampler, and the current recorders.

The *Severyanka* is to make several more research trips during 1959 (*World Fishing*, March 1959).



United Kingdom

FACTORYSHIP-TRAWLER "FAIRTRY II"
SAILS ON MAIDEN VOYAGE:

The British firm in Leith, Scotland, that owns the factory-ship-trawler *Fairtry I*, is adding two similar vessels to its fleet. *Fairtry II*, the first of the two new ones, sailed on its maiden voyage on April 2 from Glasgow.

Fairtry II, like its sistership, is equipped with stern trawling. The steep ramp up to the trawl deck from the waterline is less humped and less steep than on the *Fairtry I*, to reduce the drag when winching aboard a full trawl. The trawl is shot down this ramp, rollers and all, obviating the necessity for the manhandling that is required on a conventional side-trawler.

The full trawl is also brought up the ramp, using a 270 hp. electric trawl winch. The double cod end is lashed together once the trawl is up and then hoisted by the gantry to empty the fish on to the trawl deck; a hydraulically-operated gate closes the ramp entry to prevent fish from falling back into the sea. Once emptied on to the trawl deck, the fish are then transferred to the factory deck below through two chutes, one on each side of the deck, which can also be closed off by hydraulically-operated hatches.

From the trawl deck, the fish go into a number of pounds, built of corrugated alloy boards, and are hand-sorted for size and type. Anything other than the variety being fished for at the time is usually left in the pounds and iced up to a-

wait the end of the run before being processed. Halibut, when caught, are headed and gutted by hand and hooked on to an overhead conveyor to go first to a blast freezer and then, still on their conveyor links, to a special subzero storage hold.

Since cod is the main catch, with pollock and ocean perch next, the production line is set up for it. Large fish are slit and the livers removed before being sent to the filleters. Medium and small fish are passed, untouched, along chutes to their respective filleting machines.

The sequence is as follows: Factory hand takes graded fish from chute, puts it into a heading machine. Another hand takes it off and puts it into the filleter; from there it goes to one of two skinners. At each stage, offal is automatically diverted down to the fish-meal and fish-oil plants on the deck beneath, which have a capacity of 10 tons of dried fish meal a day. The meal is immediately bagged and transferred to dry storage with a capacity of 300 tons. Livers—from the big fish only, the smaller fish are not considered to be worth bothering about—go from the pounds into a macerator and then a two-stage digester and extractor; depending on the quantity available, the macerated livers can either pass through two extractors in succession or each extractor can be used separately.

Fillets eventually arrive at the weighing point. One operator takes them off as they arrive and weighs them into 7-pound, 14-pound, or 28-pound lots; the production is arranged so that he will not have to separate large from small fillets, which are not packed together, naturally. The scale is gimbal-mounted so as to remain level, whatever the motion of the vessel. He then packs them neatly into trays of their appropriate weights, first lining the tray with waxed paper and placing in it, upside down, a packing slip for process identification, grade, and type of fish.

When sufficient trays have been filled, they are loaded into one of the five plate freezers, each of which can freeze six tons of fillets in 24 hours. After freezing, the blocks are packed into fiberboard cases holding 56 pounds, wire-bound and then passed down a spiral conveyor into the cold-storage holds for stacking.

The ship is Diesel-electric powered by three five-cylinder engines each developing 1,340 hp., and each of which drives a directly-coupled generator developing 535 kw. at 400 v. In tandem with each main generator is a 270 kw. auxiliary gene-

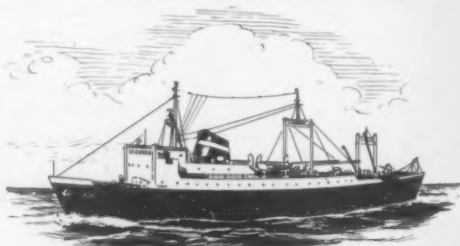


Fig. 1 - *Fairtry II*—this is one of two new large factory-ship stern trawlers constructed for a large British fishing company. The same company owns *Fairtry I*, and also the *Fairtry III* now under construction.

rator for the electrical supplies on board. The main driving motor, situated right aft, is a double armature machine rated at 2,000 s. hp., with a maximum speed of 130 r.p.m. and direct-coupled to the propeller shaft.

When the trawler is proceeding at its maximum speed, all three generators are required to supply the propulsion motor, but, on the fishing grounds, any one of the three main generators can be isolated and used to supply power to the trawl-winch motor. Thus sudden demands for extra power either for propulsion or for the trawl winch can be met, and the skipper could get increased power by bringing in an extra generator within 15 seconds.

Control of the engines is normally from the bridge, the engineroom taking over only in emergencies. Three telegraphs are provided, giving port and starboard positions on

United Kingdom (Contd.):

the bridge, and a starboard control position only on the boat deck aft to simplify manoeuvring when shooting or hauling the trawl. Operation of any one of the telegraphs causes the pointers of the other two to move to a corresponding position.

The refrigerating machinery is installed at the forward end of the engineroom. The two two-stage compressors deal with the refrigeration necessary for 30 tons of fish a day through the freezers and also maintain a temperature of -16°F . in the storage holds.

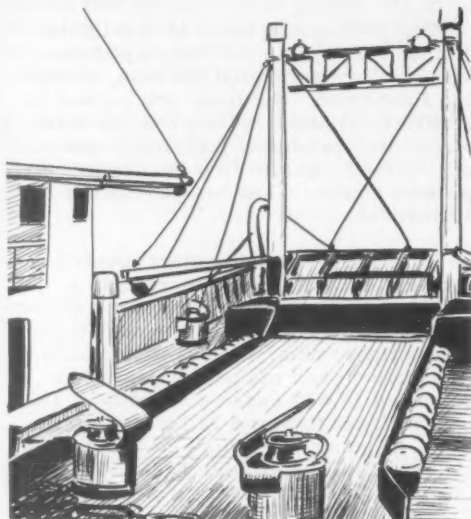


Fig. 2 - Looking aft along the trawl deck of *Fairtry II*. Trawl is winched up the ramp at the far end with the gate raised; the gate is lowered to prevent fish falling back and the trawl emptied on deck; the two chutes (one at each end of the bobbin storage racks) are opened and the fish are carried to the processing deck below.

Crew quarters are of a very high standard, consisting of four-berth cabins, with two-berth cabins for the higher ratings. Officers have single-berth cabins. There is an adequate supply of showers and a well-equipped galley to feed the crew on a cafeteria system, as well as an excellently-fitted recreation room.

Fairtry II is 235 feet over-all by 48 feet breadth-moulded; 25 feet depth-moulded to the main deck and 41 feet 6 inches depth to the bridge deck. With a crew, including factory personnel, of 96, she is able to stay at sea for 12 weeks without any difficulty; fuel oil capacity is 700 tons and a maximum consumption of 7 tons per day gives her plenty of margin.

GRANTS AND LOANS TO FISHING VESSELS TO MARCH 31, 1959:

Grants to the British inshore and near- and middle-water fishing fleets by the White Fish Authority (under the White Fish Act of 1953 and Herring Industries Act of 1957) as of March 31, 1959, amounted to about US\$17.3 million, and loans totaled about \$34.8 million.

Aberdeen, among the major fishing ports, has received the biggest share of grants and loans for conversions, new engines, and new construction since the start of the program.

Grants for construction since the beginning of the program in 1953 totaled \$16,624,000; for conversion of near- and middle-water vessels, \$210,000; and for the purchase of new engines, \$435,000. Loans for new vessels for the near- and middle-water fleets amounted to \$33,100,000; for conversions the total was \$891,000; and for new engines, \$769,000.

Grants by the Herring Industries Board made to owners at the smaller ports since the passage of Herring Industries Act in 1957 totaled \$497,000 for construction of new vessels and \$127,000 for new engines. Loans to the herring fleets totaled \$671,000 for construction of new vessels and \$175,000 for engine replacements.

INTEREST RATE ON LOANS TO FISHING INDUSTRY REVISED:

The British White Fish Authority announced that, as a result of a recent change in the rates of interest charged to them by Treasury, their own rates of interest will be changed on loans as of March 31, 1959. The new rates are: on loans for more than five years, $4\frac{7}{8}$ percent; on loans for more than 10 years but not more than 15 years, $5\frac{1}{2}$ percent; and on loans for more than 15 years, $5\frac{7}{8}$ percent.

The new rates do not apply, however, where the final installment of a loan or interim installments in current cases were paid by the Authority before March 31, 1959.

The Authority's loans are connected with the building of new fishing vessels of not more than 140 feet; the purchase, in certain circumstances, of new engines and nets and gear for inshore vessels; the construction and equipment of processing plants; and the formation and development of cooperatives.

United Kingdom (Contd.):

MARINE OIL IMPORTS AND WHALE OIL PRODUCTION:

Imports of marine oils by the United Kingdom during 1958 decreased 9.0 per cent as compared with 1957. Whale oil imports, the most important during both years, decreased 3.9 percent in 1958 as compared with 1957.

United Kingdom Imports of Marine Oils, 1957-1958		
Type	1958	1957
	(1,000 Long Tons)	
Vitamin A oil	0.3	0.4
Sperm oil, unrefined	8.6	14.6
Whale oil	136.4	141.9
Others	1.8	4.8
Total	147.1	161.7

Britain's Antarctic whale oil production in 1958 was 49,900 long tons as compared with 58,100 in 1957. In addition, 6,700 tons were produced in the Falkland Islands (12,500 tons in 1957), the Foreign Agriculture Service of the U. S. Department of Agriculture reports in an April 17, 1959, dispatch from London.

In 1958, Britain used 80,000 long tons of whale oil in margarine and 47,000 tons in compound cooking fat as compared with 67,000 tons and 44,000 tons, respectively, in 1957.

**Venezuela****FISH-PROCESSING INDUSTRY:**

The canning plant at Cumana, Estado Sucre, Venezuela, has a complete ship-to-can operation, fishing with boats built by the firm, importing United States tinplate, lithographing and producing cans, and packing sardines in tomato sauce, picante sauce, peanut oil, and in natural pack. Fish meal and fish oil are also produced.

The Cumaya plant employs approximately 480 workers at salaries of from Bs. 6.00 to Bs. 8.00 (US\$1.80 to \$2.40) a day. Canned fish production in the 1958 season totaled 217,000 cases of sardines (48-100 cans per case depending upon size of pack) and the pack for the present season is running at about the same level.

This firm produced 240,000 cans (round, square, rectangular) in 1957 and purchased the balance locally. It plans to enlarge its facilities for the production of cans and to produce a key-opened can.

The Cumana firm will soon be working with Japanese interests in fishing for and canning tuna.

The processing plant at Mariguaitar, Estado Sucre, is a well-equipped plant and employs some 400 persons, including fishermen. Sardines are packed in a variety of styles similar to the Cumana plant; also produces fish meal and fish oil. The Margarita firm mixes its own picante sauce. Cans are purchased in Venezuela.

The fish processing plant located in Punta Piedras, Isla Margarita, is a small operation, employing some 80 persons, mostly women. In the past it packed sardines, tuna, and shark products. Production over the past 5 years has averaged 17,000 cases of sardines, 198 tons of fresh fish, and 12 tons of shark-liver oil annually. This plant is seeking aid from the Venezuelan Development Corporation. At present, however, the Punta Piedras plant is concentrating on pepetones, the small local clams.

The labor forces in Venezuelan canneries are about 85 percent female with male supervisors, mechanics, and a few additional men to do the heavy work. On the whole, working conditions, wages, other benefits, and training programs are far below United States standards. Most Venezuelan canneries have local unions but there is a gradual movement towards an industry-wide organization. The major plants are working with signed union contracts and salaries are standard throughout the industry.

The plant at Cumana most closely approaches American standards for working conditions. Its employees are uniformed, work in clean surroundings, have an attendant on hand to administer first-aid, and maintain a high standard of personal cleanliness. This plant also provides a daily noon meal (consisting of soup, a vegetable, meat, a sweet, and

Venezuela (Contd.):

milk) for its employees. The only thing approximating a training program was also found in this plant where an employee serves as apprentice to an experienced worker before taking on any position on his own.

Five Venezuelan firms are now producing fish meal. These plants, all in the state of Sucre in eastern Venezuela, are located in Cumana, El Barbudo, Caiguire, and Mariguitar.

The quantity of fish meal produced in Venezuela is uncertain as local estimates vary. In 1957 one Government source reported 1,480 metric tons and a second Government source, 2,110 tons.

The second Government source reported 2,120 tons produced in 1958.

The Venezuelan Development Corporation, using figures from the second Government source, estimates that Venezuela is now 48.5 percent self-sufficient in fish meal. The nation's principal consumer is Venezuela's largest producer of animal feedstuffs.

Fish oil is produced in Venezuela only by two plants located at Cumana and Margarita. Another at La Guaira is expected to be producing fish meal and oil in the near future, the United States Embassy at Caracas reported on March 18, 1959.

Note: Also see Commercial Fisheries Review, May 1959, p. 81.



OCEANOGRAPHERS MAKE NEW PRECISE GEOLOGICAL TIME CLOCK

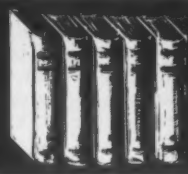
Oceanographers have succeeded in extending back in time the precise date of glacial events to well over 100,000 years. Paradoxically, this new information regarding the age of land glaciers is based upon investigations of deep-sea sediments taken far from land and two miles below the ocean surface.

More and more, science is turning to the ocean to find the answers to the problems of the earth's history. Geologists of the U. S. Geological Survey and of the University of Miami based their findings upon fine sediments which cover the floor of the Caribbean Sea. By measurements of radioactive thorium and protoactinium in these sediments it has been possible to place the age of the last interglacial period at almost exactly 100,000 years ago, thus confirming theoretical estimates previously made. These samples were obtained by deep-sea cores taken from the central Caribbean by the Woods Hole Oceanographic Institution research vessel Atlantis, by means of a device which drives a tube into the sea floor. Since sediments accumulate at the rate of about 1 inch in 1,000 years, a core-sampling tube penetrating beneath the sea floor may easily reach sediments of 100,000 years or more.

The radioactive content of the sediments provides a means of dating these samples. Other measurements made from the sample give the temperature of the sea at the time the sediments was deposited, thus linking it to the various glacial and interglacial periods of land, which influence the sea temperatures.



FEDERAL ACTIONS



Department of Commerce

BUREAU OF THE CENSUS

IMPORTED COMMODITY CLASSIFICATION CHANGES BEING CONSIDERED:

Consideration is now being given to making a limited number of changes in the present import commodity classifications (Schedule A) effective with the January 1960 statistics, according to the Bureau of the Census, U. S. Department of Commerce.

In addition to the commodity classification changes, it is also planned to prepare and release a publication for use by importers and their agents presenting the statistical commodity classifications in tariff classification arrangement. This publication (i.e., reporting manual for United States importers) would assist importers in determining the proper statistical classifications applicable to any importation and should serve to improve the accuracy of the reporting and as a result also improve the accuracy of the published import statistics.

It bears emphasizing that to carry out the work outlined above, changes in Schedule A to be effective January 1960 must be kept to a minimum. Only part (and perhaps only a small part) of the requests for changes can be made effective January 1960. However, it appears appropriate to make such changes, even though there may be difficulties in selecting those which are most urgent, since if this is not done, all requests for changes must await a full revision of Schedule A which may not take place for two or three years.



Federal Trade Commission

CONSENT ORDER PROHIBITS SHRIMP COMPANY FROM PAYING ILLEGAL BROKERAGE:

The Federal Trade Commission on May 25, 1959, ordered (Consent Order 7274, Shrimp) a New Orleans, La., shrimp company to stop paying illegal brokerage to its customers.

This action represents the adoption by the Commission of an initial decision by Hearing Examiner William L. Pack based on an order agreed to both by the company and the Commission's Bureau of Litigation.

The Commission's complaint, issued October 8, 1958, charged that 60 percent of the company's sales are not handled through brokers, but these direct purchasers are given allowances approximating the normal brokerage fee or price reductions reflecting this brokerage. These arrangements are forbidden by Sec. 2(c) of the Robinson-Patman Amendment to the Clayton Act, the complaint alleged.

The company's agreement to discontinue these payments is for settlement purposes only and does not constitute an admission that it has violated the law.



Department of the Interior

FISH AND WILDLIFE SERVICE

ALASKA BRISTOL BAY LIMITED COMMERCIAL SALMON FISHING REGULATIONS FOR 1959 ISSUED:

A limited commercial fishery for red salmon in Bristol Bay, Alaska, this year

was announced on May 25 by the Secretary of the Interior. Alaska commercial fisheries regulations previously published had closed Bristol Bay to commercial fishing for red salmon in order to insure necessary escapement of spawning fish. In announcing the regulations on April 24, the Secretary said further changes might be forthcoming in light of subsequent developments.

The Secretary said that he had authorized the change in the regulations



Sockeye (Red) Salmon
(*Oncorhynchus Nerka*)

after a thorough review of the situation in the light of recent developments, including discussions with the Japanese regarding the high-seas salmon fishery.

The new regulation will permit limited commercial fishing for red salmon in each of the major districts of Bristol Bay. Both drift nets and set nets will be permitted to operate for weekly fishing periods determined on the basis of the amount of fishing gear registered for fishing.

The regulation provides for a fishery of a type similar to recent years, but on a much more restricted basis. The so-called "gear-time table" will be utilized to regulate the fishery. However, shorter weekly fishing periods will be allowed at a given level of fishing effort than in previous years. No change is made in the regulations previously promulgated for species other than red salmon.

The Secretary has been informed by the Bureau of Commercial Fisheries that the high-seas fishery in the North Pacific will be less intense generally than last year. He has also been informed that the total quota of the Japanese fishery has been reduced this year and that with respect to red salmon--the species of particular concern in Bristol Bay--the Japanese quota throughout the area of the North Pacific in which Japanese fish-

ermen operate has been reduced from 11 million fish last year to 8 million fish this year.

In the areas frequented by North American red salmon stocks, it is expected that catches will not be sufficiently great to preclude a limited commercial fishery in Bristol Bay on these same stocks in the course of their migration to the spawning grounds. Secretary Seaton emphasized, however, that developments during the fishing season for red salmon on the high seas and in Bristol Bay will be watched very closely, and that further changes in regulations may be necessary to assure the adequate seeding of the spawning grounds to preserve the resource.

Alaska commercial fisheries regulations were revised and issued on March 7, 1959, and published in the Federal Register of March 19, 1959. For Bristol Bay salmon fishing, the revised regulations merely defined salmon fishing districts and prescribed limitations on personal use fishing with nets. A footnote explained that the issuance of the commercial salmon fishery regulations for 1959 in the Bristol Bay Area were being delayed pending clarification of the high-seas fishery situation.

On April 24, the Secretary of the Interior prescribed salmon fishery regulations for the Bristol Bay area (effective May 28, 1959), which imposed a drastic curtailment of red salmon fishing in that area in the light of an expected small cycle run of red salmon in 1959 and the prospect of an intense high-seas fishery on these same stocks of fish.

After a thorough review of the situation in the light of recent developments, including discussions with the Japanese Government, regarding the high-seas salmon fishery, it was decided to authorize a very limited commercial fishery involving all districts of the Bristol Bay area. In the areas of the North Pacific frequented by North American red salmon stocks, it is expected that catches will not be sufficiently great to preclude a limited commercial fishery in Bristol Bay, Alaska, on these same stocks in the course of their migration to the spawning grounds. Thus, the May 30 Federal Register contained amendments to Part

104 of the Alaska Commercial Fisheries regulations which will permit limited commercial fishing for red salmon in each of the major districts of Bristol Bay. As amended, salmon fishing, except trolling, in the Bristol Bay area is prohibited in all districts prior to June 1 and after August 31, 1959.

The pertinent part of the regulations as they appeared in the Federal Register follow:

§104.9 (Amendment)

3. Paragraph (a) of §104.9 is amended to read as follows:

(a) During the period June 22 to July 25, the statutory weekly closed period of 36 hours is extended so as to limit fishing to the number of days per week set out in the following table, wherein the number of days of fishing is governed by the total number of units of gear registered for fishing in the respective districts as of 6 p.m. of the Friday immediately preceding the week in which fishing is permitted.

Units of Gear by District				
Naknek-Kvichak	Nushagak	Egogik	Ugashik	Day of Fishing Per Week
Over 150	Over 324	Over 60	Over 50	1.0
	227-324			2.0
103-150	195-226	49-60	38-50	2.5
79-102	162-194	43-48	31-37	3.0
65-78	130-161	39-42	27-30	3.5
55-64	113-129	37-38	25-26	4.0
54	112	36	24	5.0

4. Paragraph (c) of §104.9 is amended to read as follows:

(c) Announcement of the total number of registrations for each district will be made locally within 18 hours after the close of registration and by publication in the Federal Register.

Note: Also see Commercial Fisheries Review, June 1959, p. 87.

* * * * *

REGULATIONS AMENDED TO PERMIT DRIFT-NET AND PURSE-SEINE SALMON FISHING ON ALTERNATE DAYS IN BEAR RIVER SECTION:

Purse seines and drift nets can now be used to fish for salmon on alternate days in the Bear River Section of Alaska. This change was published as an amendment to the Alaska Commercial Fisheries Regulations in the June 9 Federal Register. The pertinent part of the amendment to the regulations follows:

Among the proposals submitted by various segments of the fishing industry in response to the notice of proposed rule

making on 1959 Alaska commercial fisheries regulations was one which advocated a change in the regulations applicable to the Bear River Section, North Central District, Alaska Peninsula Area (Part 105), to accomplish a more equitable distribution of the allowable salmon catch among purse-seine fishermen and drift-net fishermen who compete with one another in the local fishery. No change in the prior existing regulations for this area was effected in the revision of the Subchapter adopted on March 7, 1959, principally because the dispute arose from organizational factors and from intense competition between two forms of fishing gear.

Subsequent to the adoption of the revision published on March 19, 1959, representatives of the operators of the two competing forms of fishing gear resolved their differences and urged that further controversy be avoided during the 1959 season by amending the regulations for the Bear River Section to allow purse seines and drift nets to fish on alternate days on either side of a line dividing the area in controversy. Since management and conservation of the resource will be benefited by forestalling further increases in fishing effort which otherwise almost certainly would occur in this small section, it has been determined to be in the public interest to amend the regulations accordingly.

Paragraph (b) of § 105.5 is amended to read as follows:

(b) NORTH CENTRAL DISTRICT. (1) Prior to June 21, fishing is permitted in all sections with gill nets having a mesh size of not less than 8-1/2 inches stretched measure.

(2) Nelson Lagoon section and General section, from 6 a.m. June 22 to noon September 30.

(3) In the Bear River section (i) purse seines and gill nets may be used throughout the section from 6 a.m. June 22 to 6 p.m. June 25 and from 6 a.m. July 22 to noon September 30; (ii) on June 29 and July 1, 7, 9, 13, 15, and 21, only purse seines may be used northeast of the church located near the beach about two miles northeast of the mouth of Bear River, and only drift nets may be used southwest of the church; and (iii) on June 30 and July 2, 6, 8, 14, 16, and 20, only drift nets may be used northeast of the church and only purse seines may be used southwest of the church.



White House

NATIONAL SAFE BOATING WEEK, JUNE 28-JULY 4:

A Presidential proclamation designated the week of June 28, 1959, "National Safe Boating Week," affording an opportunity to stress vessel safety.

In part, the proclamation read:

"NOW, THEREFORE, I DWIGHT D. EISENHOWER, President of the United States of America, do hereby designate the week beginning June 28, 1959, as National Safe Boating Week.

"I urge all boatmen, boating organizations, the boating industry, State and Federal agencies, and all other groups interested in boating to join in this observance of National Safe Boating Week; and I call upon them to exert greater effort during that week and throughout the boating season to keep boating safe and pleasant.

"I also invite the Governors of the States, the Territory of Hawaii, the Commonwealth of Puerto Rico, and the possessions of the United States to provide for the observance of this week to encourage nationwide interest in safe boating practices. . ."

* * * * *

PRESIDENT SIGNS PACIFIC HALIBUT FISHERY REGULATIONS:

The 1959 proposed regulations of the International Pacific Halibut Commission were adopted and signed by the President on March 31, 1959. The regulations were published in the April 16 Federal Register.

Note: Also see Commercial Fisheries Review, April 1, 1959, p. 60.



Eighty-Sixth Congress

(First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions, hearings, and other actions by the House and Senate, as well as signature into law or other final disposition are covered.



ALASKA OMNIBUS ACT: The House on June 1 passed H. R. 7120, to amend certain laws of the United States in light of the admission of the State of Alaska into the Union. In addition to a series of clarifying amendments the House adopted an amendment limiting the transfer of Federal property in connection with the transfer of functions to this act and the act of July 7, 1958 (P. L. 85-508).

The Senate Committee on Interior and Insular Affairs on May 28 ordered favorably reported with amendments S. 1541 and S. Rept. No. 331.

Senate Report No. 331, Alaska Omnibus Bill (May 28, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Interior and Insular Affairs together with individual views to accompany S. 1541), 60 pp., printed. The report contains major provisions of the bill, committee amendments,

sectional analysis of the bill, Executive Agency reports, and changes in existing law. The appendix contains Legislative Precedents for Grants of Federal Property to Newly Admitted States of the Union.

The Senate on June 3 passed with amendment H. R. 7120. The amendment substituted the amended text of S. 1541, companion bill, which had first been amended by adoption of two technical amendments of clarifying nature and a further amendment which provided for transfer without reimbursement, of any real or personal property located in Alaska and owned by the United States. Action on S. 1541 was postponed indefinitely since H. R. 7120 was passed instead by the Senate. The Senate requested the concurrence of the House for its amendments to H. R. 7120.

The House on June 11 agreed to Senate amendments, with an amendment, to H. R. 7120, and sent the bill back to the Senate requesting concurrence of the Senate in the amendment.

The Senate on June 12 concurred in a technical House amendment to H. R. 7210, this action cleared the bill for the President's signature. The legislation is largely technical providing changes in Federal laws, necessary because of the change in Alaska's status from Territory to a State, eliminating inappropriate references in Federal statutes. Other provisions are substantive, terminating certain special Federal programs in Alaska, and enabling participation by Alaska in other programs on "an equal footing with other States." The bill was drafted by the executive agencies concerned with the administration of Federal responsibilities in Alaska. Two provisions are of particular interest to fisheries interests: (1) Alaska will assume jurisdiction over its fish and wildlife resources the first day of the calendar year following expiration of 90 calendar days instead of 90 legislative days after certification by the Secretary of the Interior that the Alaska State Legislature has made "adequate provision for the administration, management, and conservation of the fish and wildlife resources of Alaska in the broad national interest." (The Secretary of the Interior made the certification on April 20. The transfer, therefore, will be effective January 1, 1960, unless Congress adjourns before the 90 days provided in the bill.) (2) authorizes the President to transfer to Alaska without reimbursement property used in a function taken over in whole or part by the State.

Alaska Omnibus Bill (Hearings before the Subcommittee on Territorial and Insular Affairs of the Committee on Interior and Insular Affairs, United States House of Representatives, 86th Congress, 1st Session, on H. R. 6091, H. R. 6109, and H. R. 6112, to amend certain laws of the United States in light of the Admission of the State of Alaska into the Union, and for other purposes, May 4 and 5, 1959), 82 pp., printed.

Alaska Omnibus Bill (Hearing before the Committee on Interior and Insular Affairs, United States Senate, 86th Congress, 1st Session, on S. 1541, a bill to amend certain laws of the United States in light of the Admission of the State of Alaska into the Union, and for other purposes, May 7, 1959), 82 pp., printed.

These reports contain a detailed analysis of the legislation and statements presented before the committees by representatives of State and Federal Agencies.

COLUMBIA RIVER FISHERIES INVESTIGATION: H. Con. Res. 192 (Ullman), a concurrent resolution to make an investigation concerning anadromous fish in the Columbia River Basin; to the Committee on Merchant Marine and Fisheries; introduced in House June 2.

FISHERIES ASSISTANCE ACT OF 1959: H. R. 7505 (McDowell), a bill to provide a program of assistance to correct inequities in the construction of fishing vessels, to enable the fishing industry of the United States to regain a favorable economic status, to provide disaster relief to the oyster industry which has been almost completely destroyed in some areas of the United States, and for other purposes; to the Committee on Merchant Marine and Fisheries; introduced in House June 2. The bill contains certain provisions similar to those provided for in H. R. 181 and related bills previously introduced. Similar to H. R. 181 and related bills previously introduced which would provide assistance to depressed segments of the fishing industry. But, in addition, H. R. 7505 would extend disaster loan provisions to include oyster producers and processors within segments of the fishing industry found to be in a distressed condition, or located in a disaster area. Such loans would be made for the improvement and modernization of plants, and for the relief of distressed conditions caused by blight or other catastrophe, and upon terms of not more than 20 years and at interest rates of not less than 3 percent. The bill further provides that when 60 percent or more of the oysters in any waters within the United States have been destroyed by blight or other catastrophe, such area shall be held to have been declared an area of major disaster under this Act.

The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries held public hearings June 4 and 11 on H. R. 181, and related bills, which would provide assistance to depressed segments of the fishing industry. Testimony was heard from Representative McDowell on the proposed legislation.

The Subcommittee on June 15 met in executive consideration of, but took no action on H. R. 181 and related bills, providing a 5-year program of assistance to enable depressed segments of the fishing industry in the United States to regain a favorable economic status.

FISH HATCHERY TRANSFER: S. 2053 (Johnston of South Carolina and Thurmond), a bill to provide for the acceptance by the United States of a fish hatchery in the State of South Carolina; also H. R. 7386 (Riley), an identical bill; both introduced on May 26; Senate bill referred to the Committee on Interstate and Foreign Commerce, House bill to the Committee on Merchant Marine and Fisheries. Provides authority for the Secretary of the Interior to accept by donation on behalf of the United States, title to the Orangeburg County, South Carolina, fish hatchery, together with rights to take adequate water from Orangeburg County Lake therefor.

FISHERIES PRODUCTS INCLUDED IN FOOD-ALLOTMENT PROGRAM: The Subcommittee on Agricultural Production, Marketing, and Stabilization of Prices of the Senate Committee on Agriculture and Forestry held hearings June 4, 5, and 8 on S. 585, and related bills S. 489, S. 663, S. 862, and S. 1884, dealing with the subject of food distribution programs. S. 585 would provide that the program of commodity distribution be expanded to include fishery products and certain other foods among items available for distribution to needy families so as to assure an adequate diet, reduce certain surpluses, and for other purposes.

FISH AND WILDLIFE AID THROUGH EQUIPMENT TRANSFER: S. 2103 (Bible), a bill to provide that surplus personal property of the United States may be donated to the States for the promotion of fish and wildlife management activities, and for other purposes; introduced in Senate June 2; also H. R. 7535 (McIntire) introduced in House June 2, H. R. 7580 (Fulton) introduced in House June 3, and H. R. 7584 (Baring) introduced in House June 5; referred to respective Senate and House Committee on Government Operations. Similar to H. R. 7190 previously introduced. Provides change in existing laws to include State Fish and Game Departments among State agencies eligible for receipt by transfer of surplus Federal Government Property and equipment for use in furthering their fish and wildlife conservation, restoration, and educational objectives.

IMPORTATION OF POLLUTED SHELLFISH PROHIBITED: S. 2112 (Jackson & 7 other Senators), a bill to prohibit the importation into the United States of polluted shellfish; to the Committee on Finance; introduced in Senate June 4. Similar to H. R. 1244 and related bills previously introduced.

INTERIOR DEPARTMENT APPROPRIATIONS: The Subcommittee of the Senate Committee on Appropriations on June 2, in executive session, marked up and ordered favorably reported to the full committee with amendments H. R. 5915, fiscal 1960 appropriations for the Department of the Interior and related agencies. Included are funds for the Fish and Wildlife Service and its two Bureaus.

Interior Department and Related Agencies Appropriations for 1960 (Hearings before a Subcommittee on Appropriations, United States Senate, 86th Congress, 1st Session, on H. R. 5915, making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1960, and for other purposes), 1109 pp., printed. Contains budget estimates, House allowances, and testimony presented by witnesses and representatives of the Department of the Interior and Related Agencies in connection with appropriations for Fiscal Year 1960. Included are funds for the Fish and Wildlife Service and its two Bureaus.

The Senate Committee on Appropriations, in executive session, on June 5 ordered favorably reported with amendments H. R. 5915 (S. Rept. No. 345). As approved, the bill would provide the Department a total of \$478,785,025, an increase of \$10,678,225 over the House-passed figure of \$468,106,800.

Senate Report No. 345, Interior Department and Related Agencies Appropriation Bill, 1960 (June 5, 1959, 86th Congress, 1st Session, Report of the Senate Committee on Appropriations to accompany H. R. 5915), 39 pp., printed. Lists by agencies appropriations for the 1959 fiscal, including funds provided for salary cost increases in the Second Supplemental Appropriations Act, 1959, Public Law 86-30; the Budget estimates, 1960; House allowance; and Committee recommendation. Included are funds for the Fish and Wildlife Service and its two Bureaus.

By unanimous vote, the Senate on June 8 passed with amendments H. R. 5915. The Senate insisted on its amendments, asked for a conference with the House, and appointed conferees. As passed by the Senate the Bureau of Sport Fisheries and Wildlife is allowed \$14,693,625, an increase of \$1,385,625 over the amount allowed by the House. The Bureau of Commercial Fisheries is allowed \$6,906,300, an increase of \$978,300 over the funds allowed by the House and \$694,700 less than the budget estimate--Administration of Alaska Fisheries was allowed \$1 million; Senate recommended restoration of House cut of \$378,000 for marketing, technology and research activities; also allowed \$50,000 for fish vessel mortgage insurance program, \$3 million for fisheries loan fund, \$325,000 for general administrative expenses, \$345,000 for construction (of which \$185,000 is for salt-water system for Galveston biological laboratory, \$25,000 for laboratory building at Karluk, Alaska, \$35,000 for Pascagoula dock repairs); and allowed an increase of \$100,000 for plans for a new vessel to replace research vessel *Albatross III*. For the Office of the Commissioner of Fish and Wildlife Service the Senate allowed \$340,000.

The House disagreed to Senate amendments to H. R. 5915; agreed to a conference requested by the Senate; and on June 11 appointed conferees.

Senate and House Conferees, in executive session on June 11, agreed to file a conference report on the differences between Senate- and House-passed versions of H. R. 5915.

House Report No. 545, Department of Interior and Related Agencies Appropriation Bill, 1960 (June 12, 1959, 86th Congress, 1st Session, Report of the Joint Senate and House Committee of Conference to accompany H. R. 5915), 9 pp., printed. Contains committee recommendations to House and Senate on the disagreeing votes of the two Houses on the amendments of the Senate to bill (H. R. 5915), making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1960, and for other purposes. Included are funds for the Fish and Wildlife Service and its two Bureaus. For the Office of the Commissioner of Fish and Wildlife Service, the Joint Committee allowed for salaries and expenses \$340,000, the same as provided by the House and Senate but \$3,000 under the budget estimate. For the Bureau of Sport Fisheries and Wildlife, the Committee allowed \$17,561,200--an increase of \$853,200 over the amount originally provided by the House, but \$1,173,625 under the amount provided by the Senate and \$69,000 under the amount requested in the budget estimate. For the Bureau of Commercial Fisheries, the Committee allowed \$10,015,000--an increase of \$517,000 over the amount provided by the

House, but \$741,300 under the amount provided by the Senate, and \$1,156,200 under budget estimates.

The House and Senate on June 15 adopted conference report on and cleared for the President H. R. 5915, fiscal 1960 appropriations for the Department of the Interior, and related agencies.

POWER PROJECTS FISHERIES RESOURCES PROTECTION: Amendments to S. 1420 (Neuberger), a bill to promote the conservation of migratory fish and game by requiring certain approval by the Secretary of the Interior of licenses issued under the Federal Power Act; to the Committee on Interstate and Foreign Commerce; introduced in Senate June 3. Provides technical amendments to S. 1420 (Neuberger) introduced in Senate March 16, 1959; bill provides the Fish and Wildlife Service with collateral jurisdiction in Federal Power Commission decisions affecting hydroelectric power development in areas where dams would impair migratory fisheries resources and wildlife values.

PRICE DISCRIMINATION ENFORCEMENT OF ORDERS: The Antitrust Subcommittee of the House Committee on the Judiciary held hearings on May 27-28 and ordered favorably reported H. R. 432, and related bills, to amend section 11 of the Clayton Act to provide for the more expeditious enforcement of cease-desist orders issued thereunder.

PROTECTION OF FISHING RIGHTS RELATIVE TO MILITARY CLOSURES: A joint resolution of the Legislative Assembly of the State of California was presented to the House on May 28. The Memorial urges that the Congress of the United States and the Secretary of Defense be requested to take all steps necessary to insure that prior to the closure of any area to fishermen by the military authorities, that a public hearing be held in the area affected, except when such closing is a matter of extreme urgency, and that all such closures be limited to those areas and times when such closing is vital to our national defense with reasons for such closing being made public whenever compatible with security restrictions; referred to the Committee on Public Works.

PUERTO RICO AND UNITED STATES COMPACT AMENDMENTS: The Senate Committee on Interior and Insular Affairs held hearings June 9 on S. 2023, to provide for amendments to the compact between the people of Puerto Rico and the U. S. with testimony favoring its enactment from Governor and Resident Commissioner of the Commonwealth. Hearings were recessed subject to call of the Chair. The proposed amendments are largely technical in order to eliminate inappropriate provisions, and to clarify, develop, and perfect the terms of existing law so as to achieve better fulfillment of purposes and strengthen the compact.

SHRIMP CONSERVATION CONVENTION WITH CUBA: The Senate on June 4 unanimously voted to adopt resolution providing for ratification of convention between the United States and Cuba for the conservation of shrimp, signed at Havana on August 15, 1958 (Ex. B, 86th Congress, 1st session). It will remain in force for 10 years and thereafter until terminated on one year's notice by either party. Instruments of ratification will be exchanged between the United States and Cuba and a meeting

will be held soon to organize the Commission and draft legislation drawn up to submit to Congress and \$100,000 budget to finance for first year.

SHIP MORTGAGE INSURANCE AMENDMENT OF 1959: The Subcommittee on Merchant Marine of the House Committee on Merchant Marine and Fisheries on June 5 ordered favorably reported to the full committee S. 1434, to amend title XI of the Merchant Marine Act, 1936, as amended, with respect to insurance of ship mortgages.

SMALL BUSINESS ACT OF 1938 AMENDMENTS: A draft of proposed legislation to amend The Small Business Investment Act of 1938, and for other purposes (with accompanying papers) was transmitted to the Senate and House by the Administrator of the Small Business Administration; referred to the respective Senate and House Committee on Banking and Currency on June 3.

The Senate Select Committee on Small Business on June 3 held hearings for the purpose of reviewing the activities and programs of the Small Business Administration, with especial emphasis on the operation of the Small Business Investment Act.

STARFISH ERADICATION IN LONG ISLAND SOUND: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries on June 3 conducted hearings on H. R. 3087 and related bills to eradicate starfish in Long Island Sound and adjacent waters. Witnesses heard were Representatives Wainwright and Giaimo.

STATE DEPARTMENT APPROPRIATIONS: Department of State and Justice, the Judiciary, and Related Agencies Appropriations for 1960 (hearings before the Subcommittee on Appropriations for the Department of State, United States House of Representatives, 86th Congress, 1st Session), 1126 pp., printed. Contains budget estimates and testimony presented by witnesses and representatives of the Department of State and related agencies in connection with appropriations for fiscal year 1960. Included are funds for the international fisheries commissions to enable the United States to meet its obligations in connection with participation in eight such commissions pursuant to treaties or conventions, and implementing Acts of Congress.

H. R. 7343 (Rooney), a bill making appropriations for the Departments of State and Justice, the Judiciary, and related agencies for the fiscal year ending June 30, 1960, and for other purposes; referred to the Committee on Appropriations; introduced in House May 21. Included are funds for the international fisheries commissions.

House Report No. 376, Departments of State and Justice, the Judiciary, and Related Agencies Appropriation Bill, Fiscal Year 1960 (May 21, 1959, 86th Congress, 1st Session, Report of the House Committee on Appropriations to accompany H. R. 7343), 28 pp., printed. Contains budget estimates

and amounts recommended by the Committee in comparison with the 1959 appropriations. Committee recommended \$1,725,000--an increase of \$61,300 over the 1959 fiscal year appropriations to meet increased pay costs, but \$29,000 below the amount of the budget request--for the international fisheries commissions.

The House on May 27 passed H. R. 7343, Departments of State and Justice, the Judiciary, and Related Agencies Appropriation Bill, Fiscal Year 1960; referred to the Senate Committee on Appropriations on May 28.

The Subcommittee of the Senate Appropriations Committee conducted hearings June 8, 9, 10, 11, and on June 12 concluded hearings on H. R. 7343.

UNEMPLOYMENT RELIEF IN DEPRESSED AREAS: H. J. Res. 411 (Slack), a House joint resolution to provide for a special research inquiry into the causes of chronic unemployment in economically depressed areas, and for other purposes; to the Committee on Government Operations; introduced in House June 3.

UNEMPLOYMENT TAX PROVISIONS FOR CERTAIN FISHING ACTIVITIES: S. 2125 (Eastland), a bill to provide that the tax imposed by the Federal Unemployment Tax shall not apply with respect to service performed by individuals in connection with certain fishing and related activities; to the Committee on Finance; introduced in Senate June 5. The bill would amend paragraph (17) of section 3306 (c) of the Internal Revenue Code of 1954 (relating to the definition of "employment" for purposes of the Federal Unemployment Tax Act). Provides that unemployment tax shall not apply with respect to service performed by an individual in (or as an officer or member of the crew of a vessel while it is engaged in) the catching, taking, harvesting, cultivating, or farming of any kind of fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life (including service performed by any such individual as an ordinary incident to any such activity), except service performed in connection with the catching or taking of halibut or salmon for commercial purposes.

WAGES: H. R. 7490 (Frelinghuysen), a bill to amend the Fair Labor Standards Act of 1938, as amended; to the Committee on Education and Labor; introduced in House June 2. Identical to S. 1967 previously introduced which would extend coverage under the Fair Labor Standards Act, and for other purposes. The proposed amendments would not change the present status of employees employed in executive, administrative, professional, or outside sales capacities. Exemptions would remain unchanged for fishermen; for agricultural and irrigation workers, learners, apprentices, messengers, and handicapped workers; for workers on agricultural commodities in the area of production; for seamen on foreign vessels; and for newsboys.



FISHERY INDICATORS

CHART 1 - FISHERY LANDINGS for SELECTED STATES
In Millions of Pounds

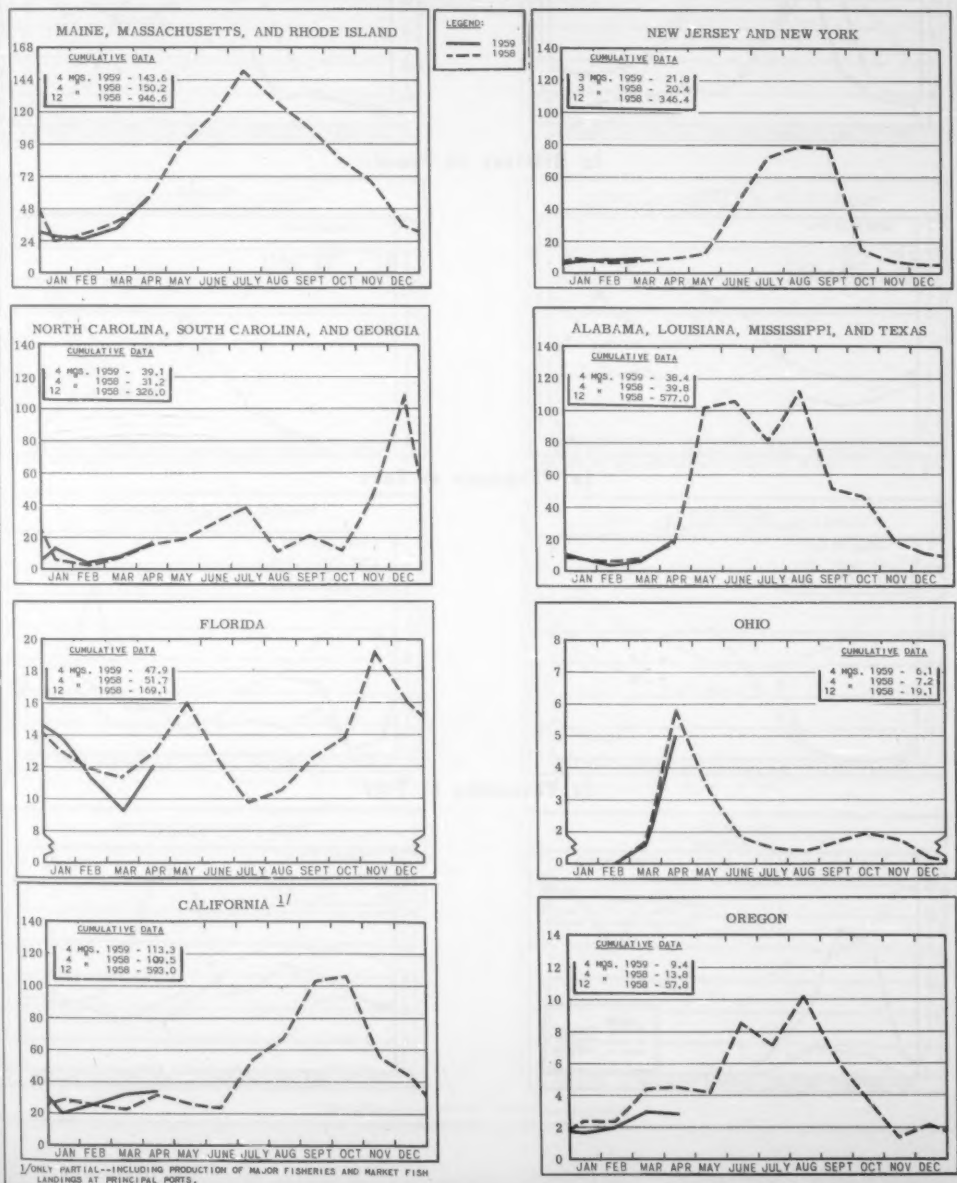
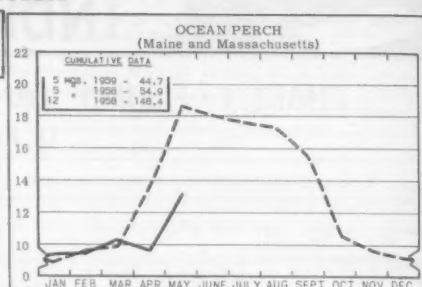
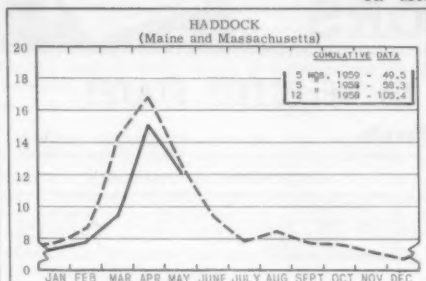
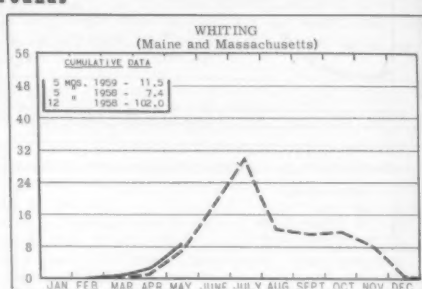
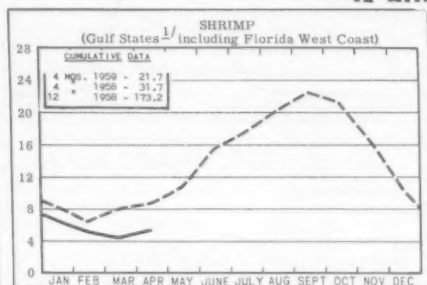


CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

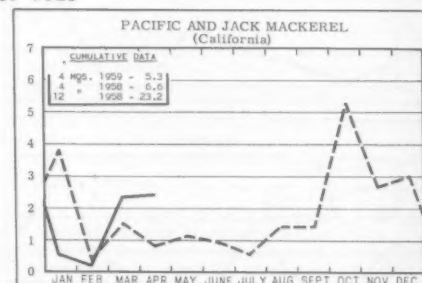
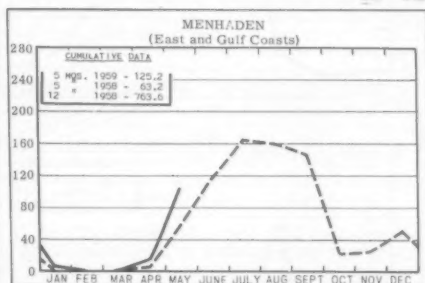


In Millions of Pounds



1/4. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

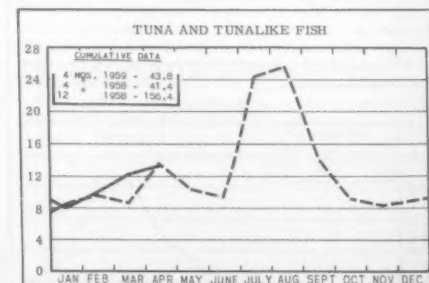
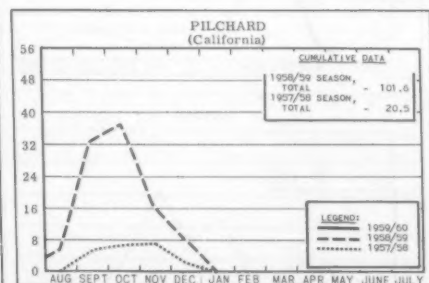
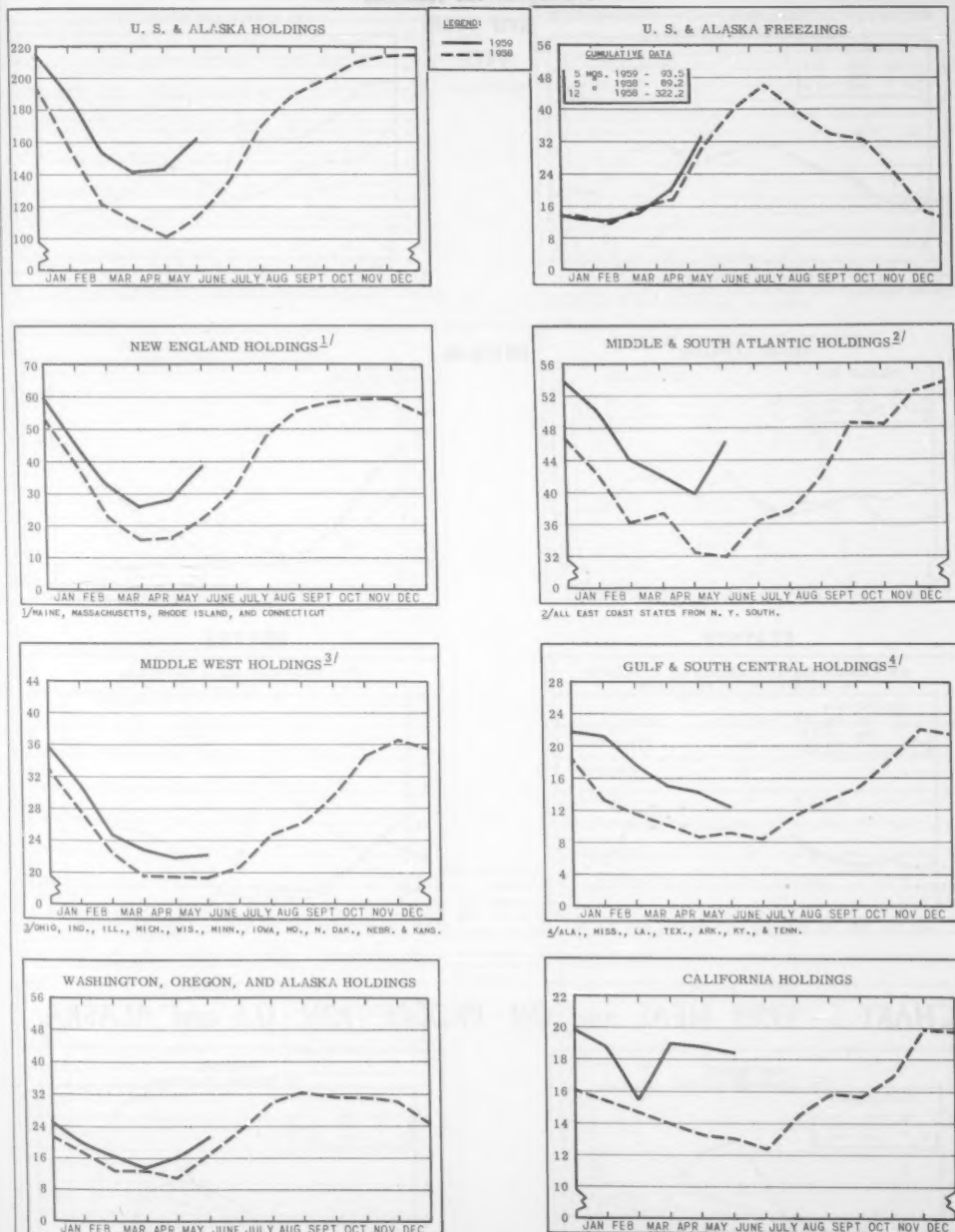


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

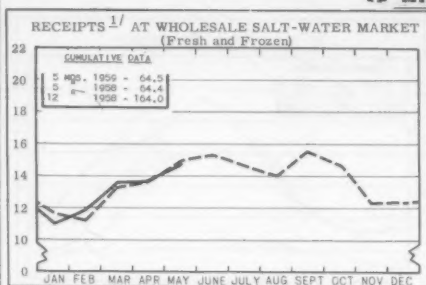
In Millions of Pounds



* Excludes salted, cured, and smoked products.

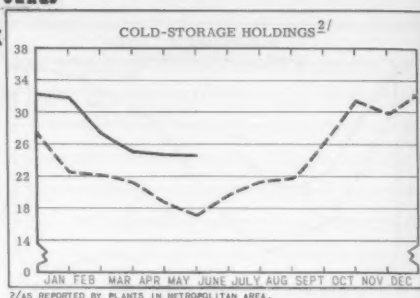
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

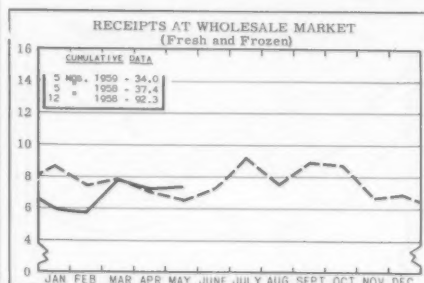


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

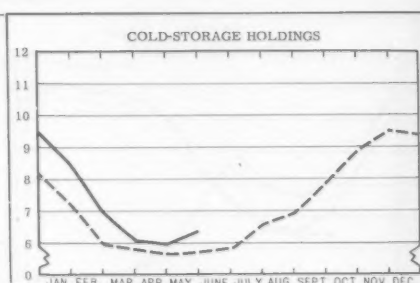
NEW YORK CITY



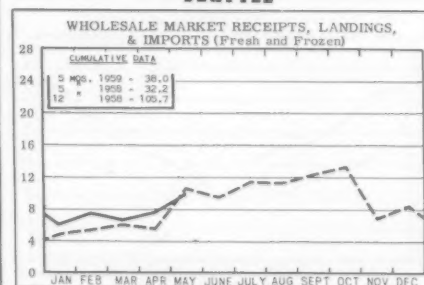
^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



SEATTLE



LEGEND:

— 1959
- - - 1958

BOSTON

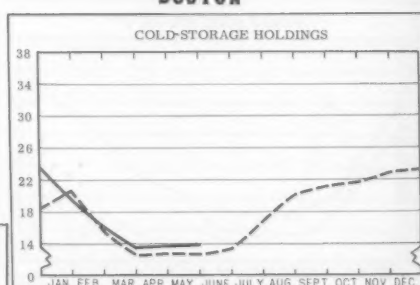


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

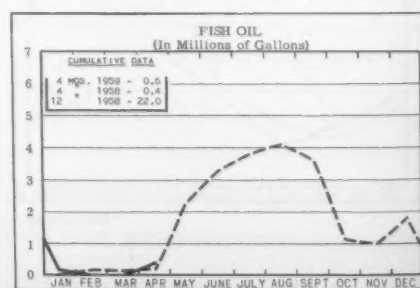
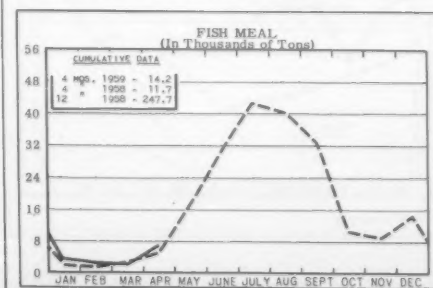
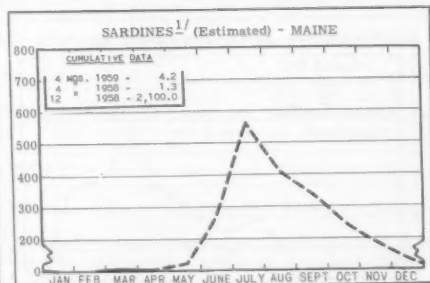
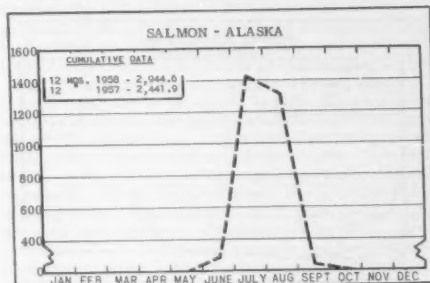
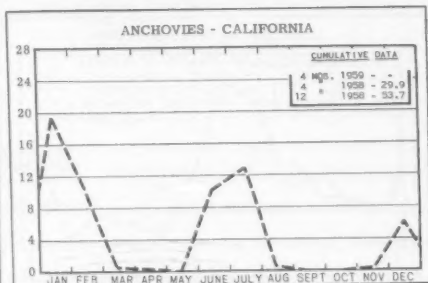
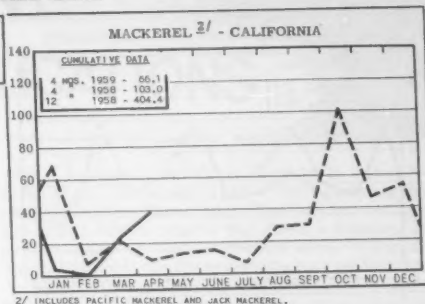
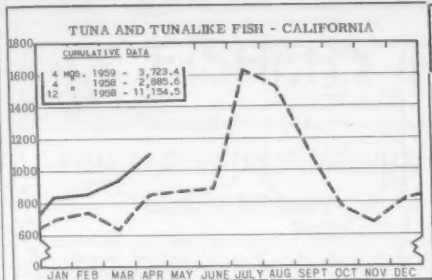


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	$\frac{1}{2}$ drawn	3 $\frac{1}{2}$ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	$\frac{1}{2}$ -lb.	8 oz.

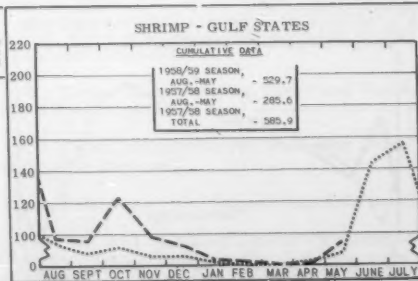
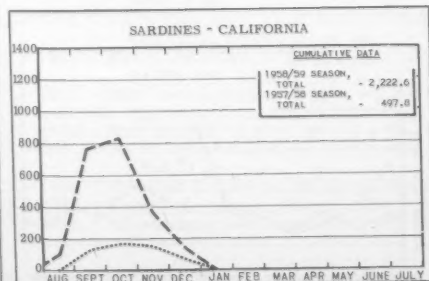
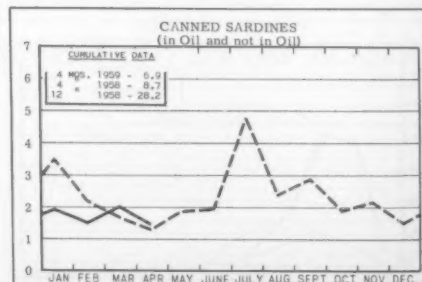
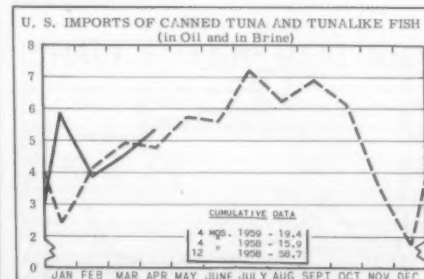
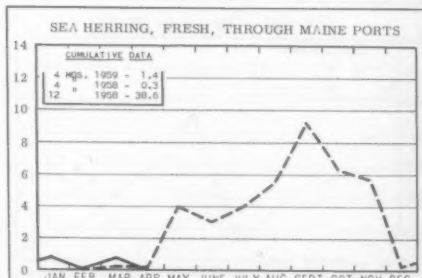
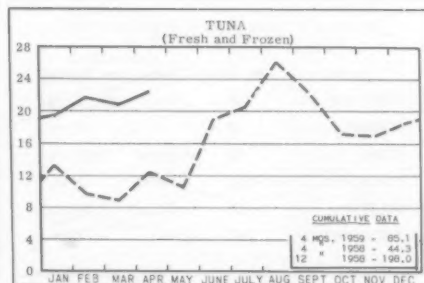
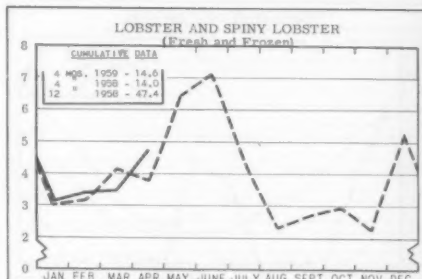
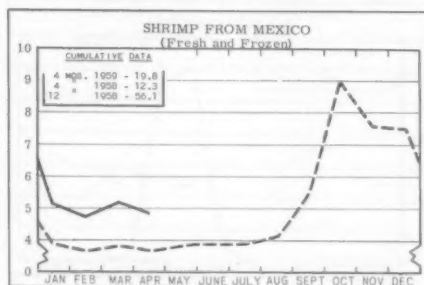
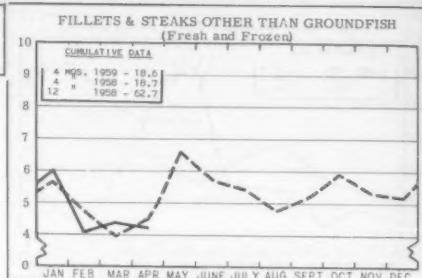
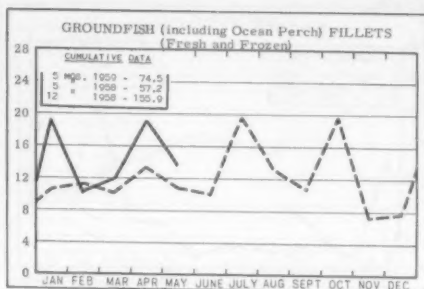
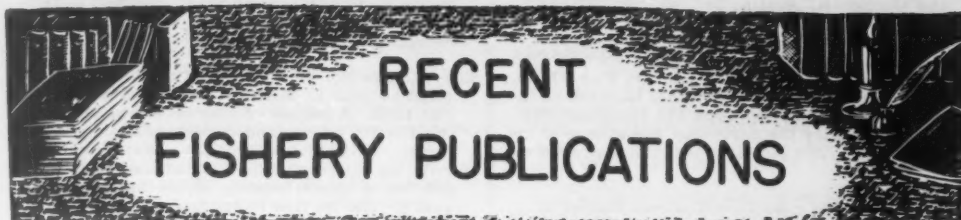


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
- FL - FISHERY LEAFLETS.
- SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
- SSR - FISH. SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
- SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

- | Number | Title |
|----------|--|
| CFS-2007 | - Mississippi Landings, January 1959, 2 pp. |
| CFS-2008 | - New York Landings, January 1959, 4 pp. |
| CFS-2011 | - Massachusetts Landings, November 1958, 5 pp. |
| CFS-2012 | - New Jersey Landings, February 1959, 3 pp. |
| CFS-2017 | - South Carolina Landings, February 1959, 2 pp. |
| CFS-2018 | - Fish Meal and Oil, February 1959, 2 pp. |
| CFS-2019 | - Massachusetts Landings, December 1958, 5 pp. |
| CFS-2022 | - Maine Landings, February 1959, 3 pp. |
| CFS-2023 | - California Landings, November 1958, 4 pp. |
| CFS-2025 | - Shrimp Landings, November 1958, 6 pp. |
| CFS-2026 | - Florida Landings, February 1959, 7 pp. |
| CFS-2028 | - Texas Landings, January 1959, 3 pp. |
| CFS-2029 | - Georgia Landings, February 1959, 2 pp. |
| CFS-2030 | - Rhode Island Landings, November 1958, 3 pp. |
| CFS-2031 | - Maine Landings, 1958 Annual Summary, by County and Gear, 10 pp. |
| CFS-2032 | - Maine Landings, 1958 Annual Summary, by Months, 5 pp. |
| CFS-2033 | - New York Landings, February 1959, 4 pp. |
| CFS-2034 | - Frozen Fish Report, March 1959, 8 pp. |
| CFS-2039 | - Rhode Island Landings, December 1958, 3 pp. |
| CFS-2044 | - Alabama Landings, January 1959, 2 pp. |
| CFS-2048 | - Florida Landings, March 1959, 7 pp. |
| CFS-2055 | - Mississippi Landings, February 1959, 2 pp. |
| FL-451 | - The Striped Bass, by Edward C. Raney, 6 pp., illus., revised May 1958. (Revision of FL-175, March 1946.) |

FL-469 - Seaweeds and Their Uses, by F. Bruce Sanford, 25 pp., November 1958. "Seaweeds are misnamed," states the author, "for they are not weeds but highly useful plants that yield a number of products having many important uses. The products obtained from the seaweeds may be divided into two groups: natural and derived. The natural products are those in which the seaweed itself is used as the end product. These may be whole, ground, or dried. Such products are used primarily for human food, for animal food, and for fertilizer. The derived products are those manufactured from seaweeds by chemical processes. Historically these products have included a wide variety of materials, such as iodine, acetone, and decolorizing carbon. The major derived products, both in the present and in the recent past, are those that have the ability to form gels and colloidal suspensions. In the United States, the principal colloidal products made from seaweeds are agar, algin, and carrageenin. Commercially these derived products are vastly more important than are the natural ones." The author discusses the growth habits of the green and blue-green algae, brown algae, and red algae; methods of harvesting; major constituents in seaweeds; and natural and derived products obtained from seaweed.

Canned Fish Retail Prices:

- FL-476e - February 1959, 27 pp.
- FL-476f - March 1959, 27 pp.

Canned Fish Consumer Purchases:

- FL-478a - December 1958, 32 pp.
- FL-478b - January 1959, 34 pp.
- FL-478c - February 1959, 34 pp.
- FL-478d - March 1959, 34 pp.

FL-484 - United States Tuna Fishery, 1911-1958, by E. A. Power, 15 pp., illus. Presents a brief history and discussion of the development of the tuna fishery--one of the United States' leading fishery resources. Included are statistical data on catch by species; imports and supply of fresh, frozen, and canned tuna; and catch and supply of bonito and yellowtail.

SL-157 - Firms Manufacturing Liver and Viscera Oil, 1958 (Revised).

SL-160 - Firms Manufacturing Menhaden Products, 1958 (Revised).

SL-161 - Producers of Packaged Fish, 1958 (Revised).

SSR-Fish. No. 249 - Gulf of Mexico Physical and Chemical Data From Alaska Cruises, compiled by Albert Collier, with note on "Some Aspects of the Physical Oceanography of the Gulf of Mexico," by Kenneth H. Drummond

and George B. Austin, Jr., 422 pp., illus., October 1958.

SSR-Fish. No. 262 - Corrosion Resistance of Fish Tagging Pins, by Albert C. Jensen, 9 pp., illus., December 1958. Aquarium-held haddock were tagged with nickel and Type 304 stainless steel pins to compare the corrosion resistance of the two metals. The stainless steel pins proved to be superior.

SSR-Fish. No. 267 - Surface-Current Studies of Saginaw Bay and Lake Huron, 1956, by James H. Johnson, 89 pp., illus., December 1958.

SSR-Fish. No. 268 - Water Quality Studies in the Wenatchee River Basin, by Robert Wendell Seabloom, 39 pp., illus., October 1958.

SSR-Fish. No. 269 - Gulf of Mexico Plankton Investigations, 1951-53, by Edgar L. Arnold, Jr., 56 pp., illus., November 1958.

SSR-Fish. No. 270 - Large-Scale Experimental Test of Copper Sulfate as a Control for the Florida Red Tide, by George A. Rounsefell and John E. Evans, 62 pp., illus., December 1958.

SSR-Fish. No. 271 - A Laboratory for Fish Behavior Studies, by H. William Newman, 12 pp., illus., January 1959.

SSR-Fish. No. 273 - Background Information for Voluntary Grade Standards on Natural Sponges, by Robert B. Bennett, 60 pp., illus., May 1958. A report on background information for a grade standard on natural sponges. The author discusses types of important sponges; grading systems; major and minor faults; average demerits characteristic of each type and grade of sponge; grading standards and prices; quantitative tests; selling by weight; and recommendations for grading standards.

SSR-Fish. No. 275 - Spawning Escapement of Okanagan River Blueback Salmon (*Oncorhynchus nerka*), 1957, by Donovan R. Craddock, 12 pp., illus., December 1958.

SSR-Fish. No. 278 - Physical Oceanographic, Biological, and Chemical Data--South Atlantic Coast of the United States, M/V Theodore N. Gill Cruise 7, by William W. Anderson and Jack W. Gehringer, 281 pp., illus., January 1959.

SSR-Fish. No. 279 - Physical, Chemical, and Biological Oceanographic Observations Obtained on Expedition Scope in the Eastern Tropical Pacific, November-December 1956, by Robert W. Holmes and other members of the Scripps Cooperative Oceanic Productivity Expedition, 123 pp., illus., November 1958.

SSR-Fish. No. 284 - Publications of the United States Bureau of Fisheries, 1871-1940, by Barbara B. Aller, 205 pp., December 1958. Discusses briefly the history of the Bureau of Fisheries and lists the publications of the Bureau from 1871 to 1940. More up-to-date publications of the Bureau of Fisheries and fishery publications of the Fish and Wildlife Service are also listed by series, authors, and subjects in Circular 36--Fishery Publication Index, 1920-54,

price \$1.50 (for sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.).

SSR-Wildlife No. 41 - The Pacific Walrus, compiled by John L. Buckley, 33 pp., illus., December 1958. A review of current knowledge and of the Pacific walrus and suggested management needs. Excessive killing has reduced the Pacific walrus population from an estimated 200,000 to approximately 45,000 in the last 100 years. The decline is continuing. Present hunting methods result in the loss of half of the walrus killed; and only half of those retrieved are fully used. Suggestions for further investigations are included.

Annual Report of the U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Bureau of Sport Fisheries and Wildlife, for the Fiscal Year 1958, 44 pp., illus., printed. (Reprinted from the Annual Report of the Secretary of the Interior, For the Fiscal Year Ended June 30, 1958.) Summarizes the various activities of the Service. Describes the activities of the Bureau of Commercial Fisheries, Industrial Research and Services; Alaska Commercial Fisheries; Columbia River Fisheries Program; Pribilof Islands fur-seal industry; and biological research (coastal, inland, and marine fisheries); Bureau of Sport Fisheries and Wildlife activities discussed include Federal aid to the states for the restoration of fish and wildlife; fish hatcheries; fishery management services; and river basin studies.

Sep. No. 551 - Shrimp Explorations off Southeastern Coast of the United States (1956-1958).

Sep. No. 552 - Research in Service Laboratories (June 1959): Contains these articles--"Flavor and Odor of Fish - Progress Report;" "Further Results on Use of Fish Oil for Ore Flotation;" and "Shark Repellent."

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Products Monthly Summary, March 1959; 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and sardines; pack of canned tuna, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna Boat Association auction sales; for the month indicated.

(Chicago) Brokers and Importers of Fishery Products and Byproducts, Chicago, Ill., 1959, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.)

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, March 1959; 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and

shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf of Mexico Monthly Landings, Production, and Shipments of Fishery Products, March 1959; April 1959; 6 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, March 1959; April 1959; 4 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Annual Summary, 1958, by John J. O'Brien, 50 pp., processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the fish marketing trends and conditions at the principal New England fishery ports, and highlights of fisheries in other areas and in selected foreign countries. Presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices by months for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and monthly landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange.

New England Fisheries--Monthly Summary, March 1959, 21 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.

Seattle, Washington, Brokers and Importers of Fishery Products, 1959, 5 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.)

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, April 1959, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria, (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimplandings; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Morphology of the White Shrimp (PENAEUS SETIFERUS, Linnaeus 1758), by Joseph H. Young, Fishery Bulletin 145 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 59), 172 pp., illus., printed, \$1, 1959. The white shrimp of the Gulf of Mexico represents an important component of the commercial shrimp catch throughout the northern, western, and southern margins of that body of water. This study sets forth in detail the anatomy of the white shrimp.

"Observations Made From an Underwater Plastic Cage," article, The Progressive Fish-Culturist, vol. 20, no. 1, 1958, p. 48, processed, single copy 25 cents.

Study of Age Determination by Hard Parts of Albacore From Central North Pacific and Hawaiian Waters, by Tamio Otsu and Richard N. Uchida, Fishery Bulletin 150 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 59), pp. 353-363, illus., printed, 15 cents, 1959.

"A Tag Holder for Use in the Field," by A. C. Jensen, article, Progressive Fish-Culturist, vol. 20, no. 2, 1958, p. 96, processed, single copy 25 cents.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS NOT FOR GENERAL DISTRIBUTION. WRITE TO U. S. FISH AND WILDLIFE SERVICE, GULF FISHERY INVESTIGATIONS, GALVESTON, TEX., ABOUT IT SINCE THAT ORGANIZATION DID THE TRANSLATING.

The Shrimp Fishery in Panama I--Evaluation of Our Wealth in Shrimp, by M. D. Burkenroad, J. L. Obarrio, and C. A. Mendoza, translation no. 16, 15 pp., illus., processed. A report on some of the work and preliminary findings of the National Laboratory of Fisheries in Panama, dealing with the biological investigation of the Panama shrimp. The purpose of this investigation is to find out scientifically the potentialities of Panama's shrimp fishery. Some of the problems and methods of investigation are discussed. Density of fish populations and replacement problems of the large white shrimp are described in considerable detail.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE NOT FOR GENERAL DISTRIBUTION. WRITE TO U. S. FISH AND WILDLIFE SERVICE, PACIFIC SALMON INVESTIGATIONS, SEATTLE, WASH., ABOUT THEM SINCE THAT ORGANIZATION DID THE TRANSLATING.

Fishery Biology and International Regulation of Fisheries, by Hiroaki Aikawa, 19 pp., processed, Translation Series No. 19. (Reprinted from Suisan Kagaku (Fisheries Science), vol. 6, no. 3-4, December 1957, pp. 2-6).

- A Consideration of International Fisheries, Mainly in Relation to the U. N. Draft of Resolution on Seas, by Nagamitsu Asano, 24 pp., processed, Translation Series No. 21. (Reprinted from Suisan Kagaku (Fisheries Science), vol. 6, no. 3-4, December 1957, pp. 6-12).

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ADEN COLONY AND PROTECTORATE:

Aden, 1955 and 1956, 136 pp., illus., printed, single copy 7s.6d. (about US\$1.05). Her Majesty's Stationery Office, York House, Kingsway, London W. C. 2, England, 1958. Contains a section on fisheries of Aden Colony and one covering those of Aden Protectorate. Each section on fisheries discusses areas and methods, organization of fishing industry and utilization of catches; marketing; events affecting production; fisheries department; and development. The fishing industry ranks second in the Colony but needs considerable development in the Protectorate. Catch statistics for the latter are included. Principal species caught are sardine, kingfish, and tuna.

ALGAE:

"Composition of the Nucleic Acids of Some Algae," by Eva M. Low, article, *Nature*, vol. 182, October 18, 1958, p. 1096, printed. St. Martins Press, Inc., 103 Park Ave., New York 17, N. Y.

ALGINATES:

"A Method for the Fractionation of Alginates," by R. H. McDowell, article, *Chemistry and Industry*, no. 43, October 25, 1958, pp. 1401-1402, printed. Society of Chemical Industry, 14 Belgrave Square, London S. W. 1, England.

ANTIBIOTICS:

"Fresh Fish. 1--Fish Preservation by Means of Antibiotics," by R. J. Nachenius and A. G. Pienaar, article, *Annual Report, Fishing Industry Research Institute for April 11-December 31, 1956*, vol. 10, p. 7, printed. Fishing Industry Research Institute, Cape Town, Union of So. Africa, 1957.

"Penetration of Chlorotetracycline into Fish Flesh and Its Heat Inactivation," by Tetsuo Tomiyama, Yasuo Yone, and Kazuo Mikajiro, article, *Nippon Suisan Gakkaishi*, vol. 22, 1956-57, pp. 778-783, printed. Japanese Society of Scientific Fisheries, Tokaiku Suisan Kenkyujo, no. 3, Tsukijima, Chuo-ku, Tokyo, Japan.

AUSTRALIA:

Statistical Bulletin: Fishing and Whaling, Australia, no. 3, 1956-57, 18 pp., illus., processed. Commonwealth Bureau of Census and Statistics, Canberra, Australia. This is the third of a series of annual bulletins dealing with the fish-

ing and whaling industry in Australia. The statistics cover quantity and value of catch and related data, for the year 1956-57 for fisheries and the 1957 season for whaling, with comparative data for the previous 4 years. The bulletin is divided into two parts; the first dealing with fisheries and the other with whaling. The part on fisheries is subdivided into a section on edible fishery products--finfish, crustaceans, and molluscs; and another on pearl and trochus shells.

CALIFORNIA:

Forty-Fifth Biennial Report, California Department of Fish and Game (July 1, 1956, through June 30, 1958), 93 pp., illus., printed. California Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif., October 1958. This report covers in detail the activities of the Department of Fish and Game from July 1, 1956, through June 30, 1958. Also included are reports of policy decisions by the Fish and Game Commission, accounts of the activities of the Wildlife Conservation and the Marine Research Committee. The section on marine resources discusses sportfisheries--party boat fishing, surf fishing, yellowtail, barracuda and white sea bass, and ocean habitat development (development of artificial reefs and new kelp beds); shellfisheries--abalone, market crab, ocean shrimp, and oysters. This section also discusses the tuna, sardine, mackerel, and anchovy fisheries; bottom fisheries; rockfish; northern California sportfish; kelp studies; special projects; and the Department's research vessels. The section on inland fisheries discusses trout hatcheries and the research program, Kokanee salmon warm-water fishes, striped bass, and sturgeon. The section on salmon and steelhead covers the spawner shortage, proposed investigations program, inland river studies, coastal streams studies, silver salmon, and other activities.

CANADA:

"Canada's Shellfish Resources," by J. C. Medcof, article, *Trade News*, vol. 11, no. 9, March 1959, pp. 5-7, 9, illus., processed. Department of Fisheries of Canada, Ottawa, Canada. The author discusses the seven species of shellfish--scallop, oysters, soft-shell clams, quahaugs, bar clams, blue mussels and periwinkles--which are marketed in Canada. Squid, a mollusk but not usually thought of as shellfish, are also marketed. In discussing what has been done for improvement of the shellfish fisheries of Canada, the author states that "Studies of shellfish have been conducted by scientists of the Federal Department of Fisheries and its Research Board with encouraging results in the search for ways of boosting the depressed or undeveloped state of the shellfish fisheries. New scallop beds have been discovered and industry has built large and small scallop boats, resulting in greatly increased landings. Methods have been devised for cleaning oysters, soft-shell clams, and quahaugs from beds that may be subject to contamination. Bait-worms were discovered in southwestern Nova Scotia which now bring C\$40,000 a year to former clam diggers. And efforts to reestablish disease-ravaged oyster populations are promising although they will not bear fruit for several years. . . . Efforts to boost the shellfish fish-

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eries are continuing. We are encouraging heavier harvesting of little-used species like bar clams, urging exploitation of known stocks of unused species like razor clams, and exploring for stocks of species like ocean quahogs which might be valuable, although they are little known or used by industry. Besides this we are continuing efforts to improve and popularize efficient mechanized methods of fishing shellfish."

Journal of the Fisheries Research Board of Canada, vol. 16, no. 2, March 1959, pp. 147-246, illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains, among others, the following articles: "The Incidence of Nematodes in the Fillets of Small Cod from Lockeport, Nova Scotia, and the Southwestern Gulf of St. Lawrence," by D. M. Scott and W. R. Martin; "Spoilage of Fish in the Vessels at Sea. 6--Variations in the Landed Quality of Trawler-Caught Atlantic Cod and Haddock During a Period of 13 Months," by C. H. Castell, Jacqueline Dale, and Maxine F. Greenough; "Biochemical Studies on Sockeye Salmon During Spawning Migration. V--Cholesterol, Fat, Protein, and Water in the Body of the Standard Fish," by D. R. Idler and I. Bitners; and "Proteins in Fish Muscle. 15--Note on the Preparation of Actin from Cod Muscle with Potassium Iodide," by J. R. Dingle.

Supplement to Hinks' "The Fishes of Manitoba," by J. J. Kelleher and B. Kooyman, FRB 481, pp. 103-117, printed. Department of Mines and Natural Resources, Province of Manitoba, Winnipeg, Canada, 1957.

CANNED FOODS:

Technical Aspects of the Evaluation of Canned Foods, by H. Chefftel, Bulletin No. 13, 52 pp., printed. Laboratoire de Recherches, Billancourt, France, July 1957.

CATFISH:

"The Reproduction and Early Development of the Sea Catfish, *Galeichthys felis*, in the Biloxi (Mississippi) Bay," by J. W. Ward, article, *Copeia*, no. 4, 1957, pp. 295-298, printed. American Society of Ichthyologists and Herpetologists, 34th St. and Girard Ave., Philadelphia 4, Pa.

CHILLING AND FREEZING:

Hvor Langt er Forskningen Naet Vedrorende Kolling og Frysning af Fisk. (Research on Chilling and Freezing of Fish), by F. Bramanaes, 8 pp., illus., printed in Danish with English summary. (Reprinted from *Kulde*, vol. 12, no. 6, 1958 pp. 61-64 and vol. 13, no. 1, 1959, pp. 5-9.) Fiskeriministeriets Forsogslaboratorium, Copenhagen, Denmark, 1959.

COD:

Additions to Laboratory Leaflets 19 and 20 Concerning the Bear Island Cod Fishery, Laboratory Leaflet No. 22 (restricted distribution), 2 pp., processed. Ministry of Agriculture, Fisheries, and Food, Fisheries Laboratory, Lowestoft, England, June 1958. Further information

on prospects for the fishery and predictions on size of fish are presented. Information is given on water conditions and fish distribution; ice reports; and stock size and small fish. According to this report, much of the destruction of small cod could be avoided by using a cod-end mesh a little larger than the regulation $4\frac{1}{2}$ inches in the Bear Island fishery. A 5-inch mesh is recommended.

La Pêche Maritime, vol. 38, no. 972, March 1959, 84 pp., illus., printed in French. La Pêche Maritime, 190, Boulevard Haussmann, Paris, France. Contains, among others, the following articles: "Vieille de Quatre Siècles, l'Industrie Française de la Morue Sera-t-Elle Contrainte à l'Abandon?" (Will the French Cod Fishing Industry, Four Centuries Old, Have to be Abandoned?), by Jean Le Touze; "L'Évolution du Marché de la Morue Amènera-Elle Prochainement une Nouvelle Orientation de la Flotte de Pêche?" (Will the Development of the Codfish Market Soon Bring About a New Orientation of the Fishing Fleet?), by Henri Quesney; "Difficultés Pour l'Armement et le Négoce Bordelais de la Morue en 1958" (Difficulties for the Cod Canning and Barrel Trade in 1958), by J. Huret; "Premier Consommateur de Morue Seche du Monde, le Portugal Veut Développer la Production Nationale," (Portugal, World's First Consumer of Dried Codfish, Plans to Develop Its National Production), "La Production Espagnole de Morue Salee Atteint 40,000 T." (The Spanish Production of Salt Codfish reaches 40,000 Tons); and "L'Industrie de la Morue au Canada" (The Codfishing Industry in Canada).

"Two Poisoning Outbreaks in Puerto Rico From Salt Preserved Codfish," by Alfonse T. Masi, Rafael A. Timothee, Rolando Armijo, Darwin Alonso, and Luis E. Mainardi, article, *Public Health Reports*, vol. 74, no. 3, March 1959, pp. 265-270, illus., printed. U. S. Department of Health Education, and Welfare, Public Health Service, Washington 25, D. C.

COMMISSIONS:

Seventeenth Annual Report of the Atlantic States Marine Fisheries Commission (to the Congress of the United States and to the Governors and Legislators of the Fifteen Compacting States), 104 pp., printed. Atlantic States Marine Fisheries Commission, 22 West First St., Mount Vernon, N. Y., March 1959. Includes a report on the state of the Commission and the work of the three basic committees--scientific, legal, and executive. Also contains reports from the North Atlantic Section on studies dealing with Georges Bank scallops; salt water fishing licenses for anglers; starfish invasion of Long Island Sound; and Enfield Dam. The Middle Atlantic Section reports on the offshore fishery for shad; estuarine problems; proposed salt-water barrier in the Delaware River; social problems of fishery research; improvement of catch statistics; effects of inshore dragging; hard clam fishery in Nantucket Sound; and starfish invasion of Long Island Sound. The Chesapeake Bay Section discusses offshore seining for shad; the blue crab research project; improvement of

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catch statistics; waste disposal in Baltimore Harbor; and passage of fish over the Conowingo Dam. The South Atlantic Section reports on the blue crab project; estuarine research; dangers of insecticides; catch statistics; impact of weather (freezes and summer droughts) on marine fisheries; exploratory fishing in the South Atlantic Section; existing shrimp program and reciprocity of shrimp licenses; enforcement of conservation regulations; and development of artificial crab bait. Appendices include, among others, reports of the Scientific Committee's Biological and Technological Section; report of the Legal Committee; a plan for estuarine research; social problems of fisheries research; and a summary of action taken on the Commission's resolutions or recommendations to the Bureau of Commercial Fisheries, 1957-58.

COOPERATIVES:

Check List of Background Material on Fishery Cooperatives, FAO/57/11/8640, 14 pp., processed; Check List of Background Material on Fishery Cooperatives (Addendum), FAO/57/12/8733, 1 p., processed. Food and Agriculture Organization of the United Nations, Rome, Italy. Lists of publications dealing specifically with fishery cooperatives assembled in connection with the FAO Training Center on Fishery Cooperatives in the Indo-Pacific Region.

CURING:

"A New Method for the Production of Smoke," by H. Olsen, article, *Konserves*, vol. 15, June 1957, p. 61, printed in Danish. Vester Farimagsgade, 31, Copenhagen V, Denmark.

DENMARK:

Årsberetning fra Fiskeriministeriets Forsøgs-laboratorium for 1958 (Annual Report to the Danish Fishing Industry for 1958), 39 pp., illus., printed in Danish with English translation of the main experimental results. Fiskeriministeriets Forsøgslaboratorium, Copenhagen, Denmark, 1959.

Publikationer fra Fiskeriministeriets Forsøgs-laboratorium, 1945-1958 (Publications from Technological Laboratory, Ministry of Fisheries), 15 pp., processed, in Danish and English. Fiskeriministeriets Forsøgslaboratorium, Copenhagen, Denmark, March 1959.

DISTRIBUTION OF FISHES:

Principles of the Distribution of Fishes and the Geological History of the Far-Eastern Seas, by G. U. Lindberg, Fisheries Research Board of Canada, Translation Series No. 141, 12 pp., processed. (Translated from *Ocherki po Obshchim Voprosam Ikhtologii*, pp. 47-51, 1953.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1958.

Some Characteristics of the Distribution of Bottom and Demersal Fishes of Far-Eastern Seas, by P. A. Moiseev, Fisheries Research Board of Canada, Translation Series No. 94, 10 pp., processed. (Translated from *Izvestiya Tikhookeanskovo Nauchno-Issledovatel'skovo In-*

stitut Rybnovo Khoziaistva i Okeanografii, vol. 37, 1952, pp. 129-137, Vladivostok.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1957.

DUNGENESS CRAB:

The Fishery and Biology of the Dungeness Crab (CANCER MAGISTER Dana) in Oregon Waters, by Kenneth D. Waldron, Contribution No. 24, 43 pp., illus., printed. Fish Commission Research Laboratory, Rte. 1, Box 31A, Clackamas, Ore. Results of studies beginning in 1947 on the biology of the Dungeness crab in Oregon coastal waters. A review is made of the history of the fishery with regard to trend of the catch by magnitude, area, and season; the development and conduct of the fishery itself; and the regulations governing the fishery.

FILLETS:

"The Expressible Fluid of Fish Fillets," by R. M. Love and O. Karsti, article, *Journal of the Science of Food and Agriculture*, vol. 9, May 1958, pp. 249-268, printed. Society of Chemical Industry, 14 Belgrave Square, London, S. W. 1, England.

FISH BAIT:

Fish Bait Culture and Care, by S. Bradley Krochmal, 44 pp., illus., printed, \$1. S. Bradley Krochmal, Suncook, N. H., 1956.

FISH FLOUR:

Studies on the Use of Deodorized Fish Flour in Malnutrition (Preliminary Report), by Federico Gomex, Rafael Ramos-Galvan, Joaquin Cravioto, Silvestre Frenk, and Isabel Labardini, 9 pp., illus., printed in English. (Translated reprint from *Boletín Medico del Hospital Infantil*, vol. 15, no. 4, pp. 485-493.) Hospital Infantil, Mexico D. F., this project is part of a series of attempts in the search of an adequate supplement for ordinary diets in the Mexican population. For the past two years, the Nutrition Department of the Children's Hospital has been studying fish flour. Results indicate that fish flour can be added, in varying percentages, to corn meal, beans, and a number of other foods. Further studies are being carried out at clinical, laboratory, and community level to test more completely the potentialities of this protein supplement.

FISH MEAL:

Fish Flour and Fish Meal by Azeotropic Solvent Processing, by Ezra Levin, 4 pp., illus., printed. (Reprinted from *Food Technology*, vol. 13, no. 2, 1959, pp. 132-135.) The Garrard Press, 510 North Hickory, Champaign, Ill. There is now being manufactured at New Bedford, Mass., a standardized, uniform, stable whole fish meal, equal to the fish from which it is derived, in biological value of protein, in unidentified growth factors, at a competitive price with conventional fish meals. It is biologically assayed and is standardized to have values 20 percent higher than an isolated vegetable protein. The advantages of this process of manufacturing fish meal are presented.

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"Fish Meal. 12--Temperature Differential Controller," by L. J. Besseling and A. M. Lewis, article, Annual Report, Fishing Industry Research Institute, 1955-56, vol. 9, p. 29, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa.

"Spontaneous Heating of Fish Meal," by G. M. Dreosti and A. N. Rowan, article, Annual Report, Fishing Industry Research Institute, 1957, vol. 11, pp. 39-45, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa, 1958.

FLORIDA:

(Florida State Board of Conservation) 13th Biennial Report, 1957-1958 (Salt Water Fishing), 59 pp., illus., printed. Florida State Board of Conservation, Tallahassee, Fla., 1959. Describes the activities of the Florida State Board of Conservation during 1957-58, summarizing the goals attained and progress achieved in the betterment of salt-water conservation. Includes chapters on conservation, sports fishing, administration of the conservation Department, research, oyster culture and rehabilitation, enforcement, licensing, seafood promotion, information-education, commercial fish landings, and commercial fishing statistics. It was found necessary, during the first half of 1958, to temporarily close the Tortugas shrimp area in the interest of conservation. That this conservation measure was sound is shown by shrimp landing reports for 1958. Despite the closed season, Tortugas yielded 8 million pounds more shrimp than it did in 1957. A major outbreak of red tide during the fall of 1957 on Florida's west coast caused the loss of countless fish. An extensive attempt was made at control by spraying copper sulphate from crop-dusting airplanes and from the State Board of Conservation's research vessel Mayan. According to this report, "When the test was finally discontinued in December 1957, a thorough analysis of the effects of the control measure was begun. This evaluation is continuing but at present it appears that the cost of extensive application would be enormous, the effect is short-lived, and side-effects on other marine life are uncertain."

"Report on the Sport and Commercial Fisheries of the Braden and Manatee Rivers," by James F. Murdock, article, Report of the Marine Laboratory of the University of Miami, no. 57-23, 1957, 22 pp., printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla.

FOOD AND AGRICULTURE ORGANIZATION:

Catalogue of FAO Fisheries Publications, compiled by Patricia M. Andrews, FAO/58/9/6896, September 1958, 18 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Current Bibliography for Aquatic Sciences and Fisheries, vol. 2, no. 1, January 1959, 158 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. Formerly titled Current Bibliography for Fisheries Sciences.

FOREIGN TRADE:

Exporting to the United States, 86 pp., illus., printed, 50 cents. Bureau of Customs, U. S. Treasury Department, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.). This booklet was prepared primarily for the information and assistance of those who plan to export to the United States. The volume and complexity of imports into this country make it necessary that certain definite procedures be followed, and those who import into the United States must have the cooperation of the exporter in order to follow the necessary procedures. In addition, there are some requirements, such as those relating to marking and preparation of invoices, which must be met by the exporter himself. This booklet outlines the procedures.

FREEZING:

"Changes During Freezing and Thawing of Fish," by J. Freixo, article, Conservas de Peixe, vol. 13, no. 146, May 1958, pp. 27-28, printed in Portuguese. Conservas de Peixe, Sociedade As-toria, Lda., Requeirao dos Anjos, 68, Lisbon, Portugal.

FREEZING FISH AT SEA:

"La Congelation a Bord au Japon" (Freezing A-board Vessels in Japan), by R. Daval, article, La Pêche Maritime, vol. 37, no. 961, April 1958, pp. 215-216, illus., printed. La Pêche Maritime, 190 Boulevard Haussmann, Paris, France. Reviews the experimental work done in Japan on fish chilling and freezing. As regards chilling of fish (mostly tuna), the author believes that a chilling and storage temperature 1° C. above the freezing point is suitable. When freezing, the whole mass of the fish must be frozen. The duration of storage in good condition was from 1 to 6 weeks for the chilled fish and from 3 to 12 months for the frozen fish. Three types of vessels were selected to be equipped with refrigerating plants: fishing boats, motherships, and fish carriers. Most of the refrigerating units used ammonia as the refrigerant in direct expansion systems. Only the motherships used indirect systems with circulating brine. Three systems of refrigeration were used: air blast, circulating brine, and circulating refrigerated sea water. The Japanese recommend thawing the fish before cooking; in France, the frozen fish is cooked immediately after removal from storage.

FRESHNESS OF FISH:

"Fresh Fish. 3--The Assessment of the Freshness of Fish by Odor," by A. N. Rowan, article, Annual Report, Fishing Industry Research Institute, April-December 1956, vol. 10, pp. 8-11, printed. Fishing Industry Research Institute, Cape Town, Union of South Africa, 1957.

GEAR:

"Instrument for Adjusting Equal Lengths of Warp Lines of Trawling Gear," by A. Bulmann, article, Die Fischereiwelt, vol. 9, September 1957, p. 57, printed in German. Die Fischereiwelt, Bundesministerium für Ernährung, Landwirtschaft

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und Forsten, Bremerhaven, German Federal Republic.

Modern Fishing Gear of the World, edited by Hilmar Kristjónsson, 680 pp., illus., printed in English with abstracts in French and Spanish, £5.5s. (US\$14.75). Fishing News (Books) Ltd., Ludgate House, 110 Fleet St., London, E. C. 4, England, 1959. According to the Food and Agriculture Organization of the United Nations, "More progress in the methods of catching fish has been made in the last thirty years than in the preceding three thousand. Today the waters of the world provide 30,000 tons of edible fish annually and biologists estimate that that figure could be doubled without depleting stocks." To assist in that commercial expansion, the Food and Agriculture Organization has been steadily spreading knowledge of the most modern fish-catching techniques. In September 1957, a major Congress (International Fishing Gear Congress) attended by some 500 delegates from all fishing countries of the world, was held in Hamburg to hear and discuss over 100 papers on all types of fishing gear and equipment. On the foundation of those papers and discussions this book was issued by the Food and Agriculture Organization. A fine editorial job of compression and selection has been done. The papers contributed have been arranged in thirteen logical sections, amplified where necessary and supplemented as required to round out as full and authoritative a presentation as has ever been issued on all aspects of modern fish-catching equipment. The sections range from details and advantages of natural and artificial fibers as used in fishing lines and net making, methods of specifying gear, the operation of all types of gear, the attraction of fish by light, and the location of fish by electronic methods, and finally there is a chapter on electrical fishing and certain factory operations at sea. In a total of some 680 pages are packed nearly half a million words as well as over 800 illuminating specific diagrams and general illustrations, making the whole a quite remarkable compendium of solid information. The book contains a particularly comprehensive index making it invaluable for reference by practical fishermen, fishery technologists, and manufacturers of all types of fishing gear from nets and trawls to floats, trawl boards, and all types of electronic gear for fish finding.

GENERAL:

Development of Commercial Fish Stocks From Lake Kronotsk, by E. M. Krokhnin and I. I. Kurenkov, Fisheries Research Board of Canada, Translation Series No. 97, 4 pp., processed. (Translated from Akademia Nauk SSSR, Ikhtologicheskaya Komissiya, Trudy Soveshchaniy, No. 4, 1954, pp. 156-159, Moscow.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1957.

Federal Aid in Fish and Wildlife Restoration (Annual Report on Dingell-Johnson and Pittman-Robertson Programs for the Fiscal Year Ending June 30, 1958), 66 pp., illus., printed, 1959. Wildlife Management Institute, Wire Bldg.,

Washington 5, D. C. This is the second annual report of the Federal Aid Programs to highlight one particular phase of the States' activities. For 1958 it is "stocking—one of the tools;" succeeding reports will highlight other activities of the fish and wildlife programs. This report contains a general program review, sport fish restoration activities, wildlife restoration activities, an extensive summary of stocking, and a summary of projects approved by the various states during fiscal year 1958. The total amount available to the States and Territories under the Federal Aid programs in 1958 was slightly more than \$28 million. Sport-fish restoration activities placed greater emphasis on investigational work than the previous year. The report was prepared by the Branch of Federal Aid of the Bureau of Sport Fisheries and Wildlife.

Laws Governing the Fluctuations in Abundance of Important Commercial Fishes, and Methods of Making Catch Predictions, by T. F. Dementeva, Fisheries Research Board of Canada, Translation Series No. 185, 22 pp., illus., processed. (Translated from Trudy Soveshchaniy, No. 1, 1953, pp. 19-36, Akad. Nauk SSSR, Ikhtologicheskaya Komissiya, Moscow.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1958.

"Some Notes on Fisheries in the New Hebrides, Fiji, and Tokelaus," by H. van Pel, article, SPC Quarterly Bulletin, vol. 9, no. 1, January 1959, pp. 42-43, illus., printed, single copy 30 U. S. cents. South Pacific Commission, Box 5254, G. P. O., Sydney, Australia. The author discusses fisheries developments in the New Hebrides, stocking of rivers in the Fiji Islands, and shell introduction into the Tokelau Islands.

GERMANY:

"Die Deutschen Kohleranlandungen 1946/47-1956/57 aus Norwegischen und Islandischen Gewässern und ihre Abhängigkeit vom Fischbestand" (The German Coal-Burning Vessels Landings 1946/47-1956/57, and their significance on the Fish Stocks), by Ulrich Schmidt, article, Berichte der Deutschen Wissenschaftlichen Kommission für Meeresforschung, Neue Folge, band XV, heft 2, 1958, pp. 145-158, illus., printed in German with English summary. E. Schweizerbart'sche Verlagsbuchhandlung (Nagel u. Obermiller), Stuttgart, Germany.

HADDOCK:

"Untersuchungen über die Vernichtung Unterwassergerätes durch die Deutsche Herings-Schleppnetzfisherei in der Nordsee" (Assessments on the Destruction of Undersized Haddock by German Herring Trawling in the North Sea), by Dietrich Sahrhage, article, Berichte der Deutschen Wissenschaftlichen Kommission für Meeresforschung, Neue Folge, band XV, heft 2, 1958, pp. 105-131, illus., printed in German with English summary. E. Schweizerbart'sche Verlagsbuchhandlung (Nagel u. Obermiller), Stuttgart, Germany.

HERRING:

International Herring Tagging in the North Sea, 1958, Laboratory Leaflet 23, 3 pp., illus., printed.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, England, July 1958.

Rapports et Procès-Verbaux des Réunions (Contributions to Special Herring Meetings, 1956--On Herring "Races"), vol. 143, part 2, 158 pp., illus., printed in English and French, Kr.30 (about US\$4.35): Conseil Permanent International pour l'Exploration de la Mer (International Council for Exploration of the Sea), Charlottenlund Slot, Denmark, March 1958.

The Stock of Herring and the Herring Fisheries on the West Coast of Sweden in the First Half of the Twentieth Century, by Karl A. Andersson, Series Biology, Report No. 8, 40 pp., illus., printed. Fishery Board of Sweden, Institute of Marine Research, Lysekil, Sweden, 1958.

"Untersuchungen an der Heringslarvenbevölkerung der Innenjade" (Research on the Herring Larvae Populations of the Inner Jade Bay), by Von A. Buckmann and G. Hempel, article, Helgolander Wissenschaftliche Meeresuntersuchungen, band 6, heft 1, 1957, pp. 52-70, illus., printed in German. Forschungsinstitut der Bundesanstalt für Fischerei, List auf Sylt, Helgoland, Germany.

HONG KONG:

Hong Kong Annual Departmental Report by the Director of Agriculture, Fisheries & Forestry (for the Financial Year 1957/58), 131 pp., illus., printed, HK\$4.00 (about 70 U. S. cents). Government Printer, Java Road, Hong Kong. This publication contains the annual reports of the various divisions of the Department of Agriculture, Fisheries and Forestry. Included in the report of the Fisheries Division is a review of its activities during the year, which were directed mainly to the marine fisheries and the mechanization of the fishing fleet, fishery investigations, training of fishermen, fresh-water fisheries, oyster culture, and pearl culture. Charts in the appendix show distant-water and main fishing grounds utilized during 1957/58. Statistical data are also given on landings of the principal species of fish in 1957/58 and on fishing vessels.

IRELAND:

Report on the Sea and Inland Fisheries for the Year 1956 (Incorporating Statistics of the Capture of Salmon, Sea Trout and Eels), 104 pp., illus., printed, 4s (about 56 U. S. cents). Government Publications Sale Office, G. P. O. Arcade, Dublin, Ireland. This report covers the activities of the Fisheries Division of the Department of Lands, and includes statistics on the quantity and value of Ireland's sea and inland fish and shellfish for 1956, and related data. Also includes, among others, sections on shrimp and crab fishing, salmon on the River Moy, and fertilization of some acid or bog lakes in Ireland.

IRISH MOSS:

"The Stability of Carrageenin in Dried Irish Moss (*Chondrus crispus*)", by E. Gordon Young and D. A. I. Goring, article, Journal of the Science

of Food and Agriculture, vol. 9, September 1958, pp. 539-541, printed. Society of Chemical Industry, 14 Belgrave Square, London S. W. 1, England.

IRRADIATION:

"Microbiological Aspects of Radiation Preservation of Food," by C. F. Niven, Jr., article, Annual Review of Microbiology, vol. 12, 1958, pp. 507-524, printed. Stanford University, Palo Alto, Calif.

JAPAN:

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 9, no. 4, February 1959, pp. 259-364 and 4 pp. supplement, illus., printed in Japanese with English abstracts. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Contains, among others, the following articles: "Study on the Salmon Fishing Grounds in the North Pacific Ocean," by Tatsuaki Maeda; "Studies on Complete Utilization of Squid (*Ommastrephes sloani pacificus*). XVIII--On the Manufacture of Salted Dried Squid Meat," by Terushige Motohiro, Seigo Fukushima, and Eiichi Tanikawa; "Quality of Edible Seaweeds Belonging to the Laminariaceae. 2--Studies on the Quality of *Laminaria japonica*," by Kiichi Murata, Keiichi Oishi, Yuko Tamura, Eiichi Kanai, Yukiko Wada, Ichiro Shibata, and Takahisa Kimura; "Studies on the Decomposition of Alginic Acid (Preliminary Report)," by Miki Oguro; "Quality of Edible Seaweeds Belonging to the Laminariaceae. 1--Evaluation of the Quality," by Keiichi Oishi, Yuko Tamura, Kinji Sasaki, and Kiichi Murata; and "Chemical Studies on Herring Meat (2)," by Shigeo Sasa.

Bulletin of Tokai Regional Fisheries Research Laboratory, no. 20, May 1958, 120 pp., illus., printed in Japanese with English summaries. Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan. Includes, among others, the following papers: "A Mathematical Consideration of the Effect of Mortality and Growth on a Fish Population," by S. Tanaka; "Some Aspects on the Water-Soluble Proteins of Squid Muscle," by J. J. Matsumoto; and "Histological and Histochemical Study of Processing the Squid Meat--I. Histological Properties of Squid Meat," by T. Tanaka.

Bulletin of Tokai Regional Fisheries Research Laboratory (Fisheries Agency) No. 21, August 1958, 62 pp., illus., printed in Japanese with summaries in English. Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan. Contains these articles: "A Consideration on the Rational Exploitation of the Stock of Sardine, *Sardinops melanosticta* (T. & S.)," by S. Tanaka; "Efficiency of a Trawl Kite Compared with Ordinary Trawlers," by S. Takayama and T. Koyama; "Swelling, Elongation, Breaking Strength, and Elasticity of Synthetic Snell Lines," "Breaking Strength of Amilan Rope at Low Temperature," "Preserving Effect of Copper Naphthenate for Fishing Nets," and "Effect of Tar Acids on Synthetic Fiber Fishing Twine," by I. Hayashi; and "Action of Polyphosphates in Fish Sausage Products--I. Influence of Processing

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Conditions on the Effects of Phosphates," by M. Okada and A. Yamazaki.

Journal of the Tokyo University of Fisheries, vol. 44, nos. 1-2, March 1958, 152 pp., illus., printed. The Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan. Contains, among others, these articles: "Influence of Change of Storage Temperature, Refreezing and Rethawing, and Defrosting Processes upon Drip from Frozen Whalemeat," by K. Tanaka, and T. Tanaka; "Effect of Bleeding Process Before Freezing upon Quality and Protective Effect of Glazing and Packaging Materials After Freezing Against Moisture Evaporation During Cold Storage of Frozen Whalemeat and Skipjack," and "Freezing, Cold Storage, and Defrosting of Whole Round Skipjack," by K. Tanaka; "Study on the Disposition of Fish Toward the Light. 2--The Strength of Illumination Preferred by Fish," by Y. Imamura; "Enrichment Pattern Resulting from Eddy Systems in Relation to Fishing Grounds," by M. Uda and M. Ishino; and "On the Bottom Character of the Submarine Oil Field in the Continental Shelf of Northeast Honshu, Japan, and a Consideration on the Relation Between Submarine Oil Field and Insular-shelf or Fisheries Bank," by H. Niino.

"The Marine Algae of Southern Saghalien," by Jun Tokida, article, Memoirs of the Faculty of Fisheries, Hokkaido University, vol. 2, no. 1, December 1954, 298 pp., illus., printed. The Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

A Review of the Japanese Salmon Fishery, by Albert M. Day, and Milo Moore, 27 pp., illus., processed. Oregon Fish Commission, 307 State Office Bldg., 1400 S. W. 5th Ave., Portland 1, Ore., 1959. This report describes the authors' impressions of Japanese fisheries while serving as advisors to the North Pacific Fisheries Commission in Tokyo during November 2 to 16, 1958. The authors discuss the importance of the Japanese fisheries; the Tokyo fish market; the Hokkaido salmon hatchery system; rearing ponds; fry release; and natural spawning. Statistical tables are included which cover various aspects of the salmon fisheries. The authors state that the people of Japan are more dependent upon the fish resources of the open seas and their inland rivers than any other people on earth.

"The Species of Gracilaria and Gracilariopsis from Japan and Adjacent Waters," by Hikoei Ohmi, article, Memoirs of the Faculty of Fisheries, Hokkaido University, vol. 6, no. 1, December 1958, 87 pp., illus., printed. The Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

"Studies on the Manufacture of Algin From Brown Algae," by N. Suzuki, article, Memoirs of the Faculty of Fisheries, Hokkaido University, vol. 3, no. 1, August 1955, printed. The Faculty of Fisheries, Hokkaido University, Hakodate, Japan.

"Studies on the Technical Problems in the Processing of Canned Salmon," by Eiichi Tanikawa,

article, Memoirs of the Faculty of Fisheries, Hokkaido University, vol. 6, no. 2, December 1958, pp. 67-138, illus., printed. The Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Results of studies dealing with decomposition of canned salmon. In clarifying the cause of decomposition, the author states that "According to the observations, the cans were under-sterilized. This may be due to the fact that even if unfresh raw salmon was prepared for the canning, the processing temperature and time used were the same as in case of fresh raw material." The author has made a scale which shows the adequate processing time corresponding to the various degrees of freshness of raw salmon used. He states that "By this scale, the freshness of raw salmon can be estimated, when the leaving time between catching and processing and storing temperature of the raw materials are already known. Next, when the degree of freshness is known, the adequate processing time will be determined at the certain definite processing temperature. The blackening of the canned salmon is affected by the freshness of the raw salmon, and the smell of the canned salmon packed in coated-cans is also affected by the freshness." The smell of the canned salmon prepared from frozen salmon was studied. This smell was clarified to be formed from the oxidation of raw salmon fat and oil during the freezing storage. "So," the author concludes, "frozen salmon should be prepared for canning within 50 days of storage. In order to prevent the oxidation of oil, 'Sustane 1-F' should be applied to raw salmon and the salmon should then be frozen. The freshness of the raw salmon plays the main part. Therefore, in salmon canning, the raw material should be always fresh, and the treatment should be performed rapidly."

KELP:

The Relationship Between Sportfishing in the Kelp Beds and the Harvesting of Kelp off the Coast of California, by David H. Davies, Kelp Investigations Program, IMR Reference 58-4, 65 pp., illus., processed. Institute of Marine Resources, University of California, La Jolla, Calif., January 10, 1958.

"A Test on Kelp Supplement," by Thomas F. Daly, article, American Fur Breeder, vol. 32, no. 2, February 1959, pp. 16-17, illus., printed, single copy 50 cents. Fur Farms Publications, Inc., 405 East Superior St., Duluth 2, Minn. This is a report of a controlled test using Norwegian seaweed as a supplement to mink feed. According to the researcher, the test showed that it reduced feed cost and at the same time helped to produce better pelts.

KENYA:

Lake Victoria Fisheries Service, Annual Report 1957/58, 45 pp., illus., printed. East African High Commission, Nairobi, Kenya, 1958. Reports on the general activities of the Lake Victoria Fisheries Service, including studies on motor fishing vessels, radio equipment, random-sample recording, improved fishing boats, deep-water fishing survey, fish meal, experimental fishing, use of gill nets, tilapia fish ponds,

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fish marking, legal enforcement, and fish culture. Also presents statistical summaries of annual catches in 1957 at recording stations in Uganda, Tanganyika, and Kenya.

LOUISIANA:

"Freshwater Commercial Fishing in Louisiana," by Lloyd Posey, article, Louisiana Conservationist, vol. 11, no. 3, March 1959, pp. 2-4, illus., printed. Louisiana Conservationist, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. Louisiana has approximately 2,000 square miles of fresh-water areas, many of which are utilized in the commercial fishing industry. A variety of gear is used in the fresh-water fisheries. State law requires that each unit of fishing gear be licensed. Catfish, buffalofish, silver carp, gar, and spoonbill are some of the primary commercial fish caught and sold in that State. For the last three years the State of Louisiana has conducted a research project to determine, among other things, the effect of commercial fishing on game fish populations. According to the author, many species of commercial fish, especially members of the sucker family, are notorious for their ability to rapidly overpopulate a body of water. "In areas of high concentration, they muddy the water and root up the bottom like a herd of hogs." When commercial fish are removed from an area this allows the game fish to take advantage of the additional food and space.

MARINE BORERS:

Marine Borers, a Preliminary Bibliography, by William F. Clapp and Roman Kenk, no. PB 131481, 355 pp., processed, \$5.00. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., February 1956.

Marine Borers, a Preliminary Bibliography.

Part II, by William F. Clapp and Roman Kenk, no. PB 131058, 358 pp., processed, \$4.75. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., June 1957.

MARINE RESEARCH:

Recent Advances in Marine Fishery Research Along the Atlantic Coast (A Report of the Biological Section of the Scientific Committee to the Atlantic States Marine Fisheries Commission), 36 pp., processed. Atlantic States Marine Fisheries Commission, 22 W. First St., Mount Vernon, N. Y., August 1958. At meetings of sectional units of the Biological Section of the Scientific Committee it was agreed to prepare for the Commissioners, as informational background for the 1958 Annual Meeting, summaries of progress in research on some of the major Atlantic Coast fish and shellfish. These progress reports form the main body of this volume. A table is included showing the important Atlantic fisheries in order of value.

MARLIN:

"Preliminary Analysis of the Distribution of White Marlin, *Makaira albida* (Poey), in the Gulf of Mexico," by Robert H. Gibbs, Jr., article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 7, no. 4, 1957, pp. 360-369,

printed. The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla.

MEDITERRANEAN FRESH-WATER FISHERIES:

Inland Water Fisheries in the GFCM Member Countries, Studies and Reviews No. 5, 20 pp., illus., processed. GFCM Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, February 1959. Presents the results of a study utilizing a questionnaire answered by the GFCM (General Fisheries Council for the Mediterranean) member countries. The information assembled was summed up in table form, and circulated to the participants of the fifth meeting of the GFCM (1958) as working document No. D-2. The member countries are Egypt, France, Greece, Italy, Israel, Morocco, Spain, Tunisia, Turkey, United Kingdom (Malta), and Yugoslavia. Statistical tables are included showing: population and fish production; inland-water fish production; imports-exports; present situation of fish culture; per capita yearly consumption; population habits concerning fish consumption; government policy concerning fish culture; fish species used for cultivation; proportion of fresh-water fisheries in total fish production.

MIDWATER TRAWL:

"The Midwater Trawl with Four Otter Boards," by J. Von Eitzen, article, Die Fischereiwelt, vol. 9, August 1957, p. 61, printed. Bundesministerium für Ernährung, Landwirtschaft und Forsten, Bremerhaven, German Federal Republic.

MINK FEED:

"The Recent Rise in Landings of Whole Fish for Mink Feed in British Columbia," by C. R. Forrester, article, Progress Reports of the Pacific Coast Stations, no. 111, August 1958, pp. 20-21, printed. Fisheries Research Board of Canada, Pacific Fisheries Experimental Station, 898 Richards St., Vancouver, B. C., Canada.

MULLET:

"Offshore Spawning of the Striped Mullet, *Mugil cephalus*, in the Gulf of Mexico," by Edgar L. Arnold, Jr. and John R. Thompson, article, Copeia, no. 2, 1958, pp. 130-132, printed. American Society of Ichthyologists and Herpetologists, 34 St. and Girard Ave., Philadelphia 4, Pa.

NETS:

"Synthetic Drift Nets--Some Preliminary Observations," by I. D. Richardson, article, World Fishing, vol. 8, no. 4, April 1959, pp. 76-78, illus., printed. John Trundell, Ltd., St. Richards House, Eversholt St., London, N. W. 1, England. Interest has been shown by the English herring industry in the possible use of the new synthetic fibers as a replacement for the cotton drift net. The author describes some tests that were made to compare the two materials, and in summary he states that "The main point of interest is that the fishing size of the cotton net is considerably smaller than the dry mesh size; whereas in the case of the synthetic net tested, the wet mesh size is similar to its

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dry mesh size. Thus a mesh of the same dry size in each material will not fish at the same size in the water, and due allowance must be made." Only one type of synthetic material was used for comparison, so the results do not necessarily apply to herring drift nets made of any other synthetic material.

NEW JERSEY:

Annual Report, New Jersey Department of Conservation and Economic Development, Division of Fish and Game (For the Fiscal Year Commencing July 1, 1955 and Ending June 30, 1956), 44 pp., illus., printed. Department of Conservation and Economic Development, Trenton, N. J., June 30, 1956. Reports on the activities of the Division of Fish and Game during the fiscal year 1955/56; lists the regulations for 1956 (Fish and Game Code); and includes sections on law enforcement and conservation education and public relations. A section of the report discusses the fisheries management program, fisheries field operations, federal aid to fisheries, 1955/56 salvage operations and values, Federal distribution of fish, New Jersey landings for the calendar year 1955, and stocking of inland waters by the State Division of Fish and Game. A section is also included on wildlife management.

NIGERIA:

Annual Report of the Fisheries Department of the Eastern Region of Nigeria for the Year, 1957-58, 5 pp., printed, 1s. (14 U. S. cents). The Government Printer, Enugu, Nigeria, November 1958. This report covers activities of the Fisheries Department, including procurement of surf boats, recruitment of trainee fishermen at two fishing stations, stocking of fish ponds, the fish farm at Umuna, and choice of a site for a base for powered sea-fishing boats at James-town.

NORWAY:

"Fiskerne og Farkostene i Vintersildfisket, 1958" (Fishermen and Craft in the Winter Herring Fishery, 1958), by Sverre Mollestad, article, Fiskets Gang, vol. 45, no. 11, March 12, 1959, pp. 166-174, illus., printed in Norwegian. Fiskets Gang, Postgiro Nr. 691 81, Bergen, Norway.

NUTRITION:

Food Facts Talk Back (Food Information - Fallacies and Facts), 32 pp., illus., printed, 50 cents. The American Dietetic Association, 620 No. Michigan Ave., Chicago 11, Ill., June 1957. An attractive booklet which describes a dietetically-sound daily food plan, fallacies about foods and nutrition, misconceptions about weight reduction, food myths--pregnancy and lactation, and reliable sources of information. Contains reference to the food fallacies pertaining to fish and shellfish. The authors assert that: "The statement that the combination of fish and milk is poisonous no doubt originated in days before refrigeration, when, by coincidence, people who were eating fish that was not strictly fresh also happened to be drinking milk at the same meal. People who refuse to eat fish and drink milk today probably never think of it as inconsistent when they eat fish chowder or oyster stew made with milk, or fish with cream

sauce. If two foods can be eaten separately, they can also be used in combination without harm."

OCEANOGRAPHY:

"Effect of Water Clarity on Albacore Catches," by G. I. Murphy, article, Limnology and Oceanography, vol. 4, no. 1, January 1959, pp. 86-93, printed. Limnology and Oceanography, Woods Hole Oceanographic Institution, Woods Hole, Mass.

Oceanographic Papers in Japan--1873-1938 (annotated Bibliography), 239 pp., printed. Japanese National Commission for Unesco, Tokyo, Japan, March 1957.

Oceanographic Papers in Japan--1939-1957 (annotated Bibliography), 223 pp., printed. Japanese National Commission for UNESCO, Tokyo, Japan, March 1958.

OYSTERS:

The Rise and Decline of the Olympia Oyster, by Earl N. Steele, 142 pp., illus., printed. Fulco Publications, Box 37, Elma, Wash., 1957. This book covers more than 50 years of the lives of the pioneer oystermen of Puget Sound, and the part they took in the development of the native oyster found in the waters of southern Puget Sound. It also describes how, after perfecting a superior system of oyster culture, which yielded abundant crops, they developed a market which readily utilized the supply. The causes of the decline of the industry are discussed in some detail.

PACKAGING:

Food Packaging Materials, Their Composition and Uses, Publication 645, 53 pp., printed. National Academy of Sciences--National Research Council, Washington 25, D. C., 1958. The objective of this study is to aid in evaluating the importance of current practices in the food trades from the standpoint of public health and developing principles for selection of components for use in food packaging. The report discusses characteristics and uses of different types of food packaging and of materials used in food packaging. Also among the subjects covered are plasticizers, stabilizers, antioxidants, release agents, adhesives, printing inks, etc. Included in the booklet is a list of chemicals used in making packaging materials.

"Pouch Packaging on Upswing," article, Frosted Food Field, vol. 27, October 1958, pp. 34-36, printed. Frosted Food Field, Inc., 321 Broadway, New York 7, N. Y.

PAKISTAN:

Annual Report of the Directorate of Fisheries, East Pakistan, for the Year Ending March 31, 1957, 151 pp., illus., printed. East Pakistan Government Press, Dacca, East Pakistan, 1958. Describes the work of the Directorate of Fisheries during 1956/57. Contains, among others, sections on Administration of the Protection and Conservation of Fish Act, 1950; production and development of fish farms, reclamation of derelict water areas, nursery fish farms, introduction of exotic fish, and

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research on control of aquatic vegetation; and shrimp culture. Short-term projects were approved for transport of fish in the district of Sylhet, mechanization of fishing vessels, expansion of net factory, "grow more fish" campaign, and procurement of fishing supplies for needy fishermen. The activities of the Technology Section fall under two major heads--laboratory research and investigations, and operation of pilot projects. The report also presents statistical tables covering quantities of fish exported, processed, and transported by species and districts; average wholesale and retail prices for various species and types of fish; and number of fishermen and vessels in relation to quantity of fish landed in various districts.

PEARL FISHERY:

"La Aventura de las Perlas" (The Pearl Adventure), by Carlos Agüero Gomez, article, *El Agricultor Venezolano*, vol. 22, no. 204, November-December 1958, pp. 6-9, illus., printed in Spanish. *El Agricultor Venezolano*, Information Section, Ministry of Agriculture and Breeding, Caracas, Venezuela.

PEARL SHELL:

"Pearl Shell Investigation in the Cook Islands," by J. L. Noakes, article, *South Pacific Commission Quarterly Bulletin*, vol. 9, no. 1, January 1959, pp. 22-24, illus., printed, single copy 30 U. S. cents. South Pacific Commission, Box 5254, G. P. O., Sydney, Australia.

PILCHARDS:

The Biology of the South African Pilchard (*SARDINOPS OCELLATA*), by D. H. Davies, Investigational Report No. 32, 10 pp., illus., printed. (Reprinted from Commerce and Industry, December 1957.) Division of Fisheries, Beach Road, Sea Point, Cape Town, Union of South Africa, 1957.

PLAICE:

"Zur Beziehung Zwischen Bestandsdichte und Wachstum in der Schollenbevölkerung der Deutschen Bucht" (With Reference to the Consistency and Growth of the Plaice Populations of the German Bight), by Gotthilf Hempel, article, *Berichte der Deutschen Wissenschaftlichen Kommission für Meeresforschung*, Neue Folge, band XV, heft 2, 1958, pp. 132-144, illus., printed in German with English summary. E. Schweizerbart'sche Verlagsbuchhandlung (Nägele u. Obermiller), Stuttgart, Germany.

PLANKTON:

Measurements of Primary Production in the Sea (Contributions to Plankton Symposium, 1957), articles, *Rapport et Proces-Verbaux des Reunions*, vol. 144, 158 pp., illus., printed in English and French, Kr. 30 (about US\$4.35). Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark, April 1958.

PORTUGAL:

Gremio dos Armadores da Pesca da Sardinha, Relatório e Contas do Exercício de 1958 e Orçamento para 1959 (Sardine Vessel Owners'

Guild, Statement of Operations for 1957 and Budget for 1958), 22 pp., illus., printed in Portuguese. Comissão Revisora de Contas, Lisbon, Portugal.

PRESERVATION:

"Preservation (by Acidification) of Fish Waste Products and Poor-Quality Fish," by L. L. Lagunov, L. N. Egorova, N. I. Rekhina, and M. N. Eremeeva, article, *Rybnoe Khoziaistvo*, vol. 32, no. 9, 1956, pp. 78-83, printed. Ministerstvo Rybnoi Promyshlennosti SSSR, Kotel'ni-cheskaia Naberezhia D 1/15, Moscow, Zh-240, U. S. S. R.

"Preservation of Fresh Fish," by H. L. A. Tarr, article, *Archiv für Fischereiwissenschaft*, vol. 8, 1957, pp. 9-21, printed. Gustav Wenzel & Sohn, Braunschweig, Germany.

PROMOTION:

"Development of National and International Co-operative Campaigns for Consumer Education on Fish," by O. Hanssen, article, *Norsk Fryserinaering*, vol. 10, no. 7-8, 1958, pp. 1-15, printed in Norwegian. Norsk Fryserinaering, Primsemgate no. 6, Oslo, Norway.

RED TIDE:

"Some Biochemical Aspects of Red Tides and Related Oceanographic Problems," by Albert Collier, article, *Limnology and Oceanography*, vol. 3, no. 1, 1958, pp. 33-39, printed. Woods Hole Oceanographic Institution, Woods Hole, Mass.

REFRIGERATED SEA WATER:

"Transport and Storage of Fish in Refrigerated Sea Water," by H. L. A. Tarr and J. S. M. Harrison, article, *Annual Review and Program, Fisheries Council of Canada*, April 1957, pp. 35, 37, 39, 41, printed. Fisheries Council of Canada, Ottawa, Canada.

REFRIGERATION:

"International Survey on Refrigeration Equipment and Activities, 1957," section, *Bulletin de l'Institut International du Froid*, vol. 39, no. 1, 1959, pp. 213-312, printed in French and English. Institut International du Froid, 177 Boulevard Malesherbes, Paris (17^e), France. The first part of the results of a general survey of refrigeration activities in various countries made in 1958.

"Preserving the Catch with Refrigerated Sea Water," by S. W. Roach and J. S. M. Harrison, article, *World Fishing*, vol. 8, no. 4, April 1959, pp. 88-89, illus., printed. John Trundell, Ltd., St. Richards House, Eversholt St., London N. W. 1, England. The authors describe a 45-ft. steel vessel, launched in British Columbia in 1958, which was designed to utilize the refrigerated sea-water method of fish preservation but which can also hold fish in the conventional manner. The vessel is primarily a salmon troller but is easily adaptable to halibut long-lining, trawling, or crabbing. Refrigeration is supplied by a high-speed automotive-type compressor, belt-driven by the main engine.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

SALMON:

On the Dynamics of Abundance of the Sockeye Salmon (*ONCORHYNCHUS NERKA* Walb.), by F. V. Krogus, Fisheries Research Board of Canada, Translation Series No. 101, 16 pp., illus., processed. (Translated from *Izvestiia Tikhookeanskovo Nauchno-Issledovatel'skovo Instituta Rybnovo Khoziaistva i Okeanografii*, vol. 35, 1951, pp. 1-16, Vladivostok.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1957.

"The Future of the Atlantic Salmon," article, *Trade News*, vol. 11, no. 8, February 1959, pp. 3-6, illus., processed. Department of Fisheries, Ottawa, Canada. The Atlantic salmon, in its fight for survival in Canada, has caught the imagination of many people in recent years. Concern for its well-being extends beyond the ranks of Canadian federal and provincial fisheries administrators and biologists and commercial and sport fishermen. This was made evident by interest shown in two recent speeches given by Canadian officials at annual meetings of associations of sport fishermen—one in Boston and the other in Montreal. It was pointed out, in the first speech, that the Canadian Fisheries Department recognizes that the number of sport fishermen is increasing but that the salmon stocks could be managed to provide both a commercial and sport fishery, with certain regulatory restrictions. The salmon can still be found, in varying numbers, in about 300 eastern Canadian rivers and streams but in many of them the runs are small. The evidence still shows that the decline in salmon stocks is continuing. However, the Fish Culture Development Branch of the Canadian Department of Fisheries and the Fisheries Research Board's biological stations, at St. Andrews, New Brunswick, and St. John's, Newfoundland, have for some time given a high priority to all matters pertaining to the Atlantic salmon fisheries. So has the Marine Biological Station of the Quebec Department of Fisheries.

On the Production of Young Sockeye Salmon (*ONCORHYNCHUS NERKA* Walb.), by F. V. Krogus and E. M. Krokhin, Fisheries Research Board of Canada, Translation Series No. 109, 30 pp., illus., processed. (Translated from *Izvestiia Tikhookeanskovo Nauchno-Issledovatel'skovo Instituta Rybnovo Khoziaistva i Okeanografii*, vol. 28, pp. 3-27.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1958.

Qualitative Characteristics of the Stocks and the Dynamics of Abundance of the Autumn Chum Salmon of the Amur River, by I. B. Birman, Fisheries Research Board of Canada, Translation Series No. 103, 16 pp., illus., processed. (Translated from *Izvestiia Tikhookeanskovo Nauchno-Issledovatel'skovo Instituta Rybnovo Khoziaistva i Okeanografii*, vol. 35, 1951, pp. 17-31, Vladivostok.) Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, 1957.

"Rapid Learning of a Constant Course by Travelling Schools of Juvenile Pacific Salmon," by William S. Hoar, article, *Journal of the Fisheries Research Board of Canada*, vol. 15, no. 2, 1958, pp. 251-274, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Return of Silver Salmon, *Oncorhynchus kisutch* (Walbaum), to Point of Release," by Lauren R. Donaldson and George H. Allen, paper, *Transactions of the American Fisheries Society* (Eighty-Seventh Annual Meeting, 1957), pp. 13-22, printed. Librarian, American Fisheries Society, Colorado A and M College, Fort Collins, Colo., 1958.

Salmon of the Pacific Northwest: Fish vs. Dams, by Anthony Netboy, 134 pp., illus., printed. Binsfords & Mort, Portland, Ore., 1958.

"Some Effects of Artificial Light on Salmon Eggs Larvae," by Ronald Eisler, Paper, *Transactions of the American Fisheries Society* (Eighty-seventh Annual Meeting, 1957), pp. 151-162, printed. Librarian, American Fisheries Society, Colorado A and M College, Fort Collins, Colo., 1958.

SARDINES:

Etude Intensive d'une Aire de la Ponte de la Sardine (*SARDINA PILCHARDUS* Walb.) en Adriatique Moyenne en 1950/1951 (Intensive Study of a Sardine Spawning Area in the open waters of the Adriatic Sea in 1950/1951), by T. Gamulin and J. Karlovac, *Acta Adriatica*, vol. 8, no. 3, 1956, 46 pp., illus., printed in French. Institute of Oceanography and Fisheries, Split, Yugoslavia.

"Frozen Sardines," by M. Bours, *Revue des Travaux de l'Institut des Pêches Maritimes*, vol. 22, no. 3, September 1958, pp. 255-289, illus., printed in French. Institut Scientifique et Technique des Pêches Maritimes, 59 Avenue Raymond-Poincaré, Paris 16, France. A detailed account of tests on the freezing of sardines and on the processing of frozen sardines.

Investigations on the Larvae and Postlarvae of the Sardine (*SARDINA PILCHARDUS* Walb.) in the Open Waters of the Adriatic Sea (M. V. Hvar Cruises, Researches into Fisheries Biology, 1948/1949), by J. Karlovac, Reports, vol. 4, no. 4D, 23 pp., illus., printed in English. Institute of Oceanography and Fisheries, Split, Yugoslavia.

Preliminarna Opazanja o Srdeli (*SARDINA PILCHARDUS* Walb.) Sa Zapadne Obale Istre (Preliminary Observations on Sardine from the West Coast of Istria), by R. Muzinic, *Acta Adriatica*, vol. 8, no. 11, 5 pp., illus., printed in Serbo-Croatian with English summary. Institute of Oceanography and Fisheries, Split, Yugoslavia, 1958.

Prilog Izucavanju Odnosa Srdele (*SARDINA PILCHARDUS* Walb.) i Njezine Sredine (A Contribution to the Investigation of Relations of Sardine

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SCALLOPS:

Scallop Recipes, 5 cards, printed. New Bedford Seafood Council, 60 No. Water St., New Bedford, Mass. Recipes for large quantities--45-50 servings.

SHAD:

"Age and Growth of the American Shad, from three Atlantic Coast Rivers," by Donald F. LaPointe, paper, *Transactions of The American Fisheries Society* (Eighty-Seventh Annual Meeting, 1957), pp. 139-150, printed. Librarian, American Fisheries Society, Colorado A and M College, Fort Collins, Colo., 1958.

SHELLFISH:

Sanitary Criteria for Shellfish by Species and by Area, by Robert L. Dow, 7 pp., processed. (Reprinted from *Proceedings of the National Shellfisheries Association*, vol. 48, 1958, pp. 23-29.) Department of Sea and Shore Fisheries, Augusta, Me. Recommendations to establish shellfish sanitary criteria by species and areas were approved by the National Shellfish Sanitation Conference in 1954 on the basis of laboratory and field observations and experiments reported by the author. To implement these recommendations (1) further studies were conducted in Maine to evaluate the relative importance of hydrographic, geological, and biological factors having actual or potential influence on the sanitary qualities of shellfish growing areas, and (2) cooperative experiments among the several northeastern states (Maine, Massachusetts, Rhode Island, Connecticut, and New York) have been carried on to establish standards for blue mussel (*Mytilus edulis*) and soft clam (*Mya arenaria*) shell stock.

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"Australian Prawn Trawling Industry's Promising Future," article, *World Fishing*, vol. 7, no. 30, October 1958, p. 31, printed. John Trundell, Ltd., St. Richard's House, Eversholt Street, London, N. W. 1, England.

"Convention With Cuba for Conservation of Shrimp," article, *The Department of State Bulletin*, vol. 50, no. 1034 (Publication 6807), pp. 566-569, printed, single copy 25 cents. Public Services Division, Bureau of Public Affairs, U. S. Department of State, Washington 25, D. C. (For sale by the Superintendent of Documents, Washington 25, D. C.) Contains the text of the convention between the United States of America and Cuba for the conservation of shrimp, signed at Havana on August 15, 1958; the report of the Acting Secretary of State; and a message of transmittal by the President to the United States Senate.

TAGGING:

"An Inexpensive Easily Constructed Fish-Marking Tag," by Fergus J. O'Rourke, article, *Nature*,

vol. 181, no. 4608, 1958, p. 577, printed. St. Martin's Press, Inc., 103 Park Ave., New York 17, N. Y.

A Preliminary Review of Pertinent Past Tagging Investigations on Pink Salmon and Proposal for a Co-ordinated Research Program for 1959, Report No. 1, 47 pp., illus., processed. International Pacific Salmon Fisheries Commission, P. O. Box 30, New Westminster, B. C., Canada, June 1958.

THAWING:

"The Thawing of Blocks of Small Fish," by S. Gakicko, K. Pensakaja, V. Borodin, and A. Boronova, article, *Kholodil'naya Tekhnika*, no. 3, 1958, pp. 39-44, illus., printed in Russian. (For sale at Four Continent Book Corp., 38 W. 58th St., New York 19, N. Y.)

TRADE LIST:

The Commercial Intelligence Division, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., has published the following mimeographed trade list. Copies may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$2 each.

Oils (Animal, Fish, and Vegetable)--Importers, Dealers, Producers, Refiners, and Exporters, Paraguay (April 1959). Lists the name and address, size of firm, and type of product handled by each firm. Includes firms dealing in fish oils.

TUNA:

"Keeping Quality and Cold Storage of Albacores Caught off French Western Africa," by J. R. Crepey, article, *Revue des Travaux de l'Institut des Pêches Maritimes*, vol. 22, no. 3, September 1958, pp. 291-301, illus., printed in French. Institut Scientifique et Technique des Pêche Maritime, 59 Avenue Raymond-Poincaré, Paris 16, France.

"Tuna Meat Pigment Studies," by J. J. Naughton, M. M. Frodyna, and H. Zeitlin, article, *Agricultural and Food Chemistry*, vol. 6, no. 12, December 1958, pp. 933-938, printed. American Chemical Society, 1801 K St., NW., Washington, D. C.

TURKEY:

Balık ve Balıkçılık (Fish and Fishery), vol. 7, no. 4, April 1959, illus., printed in Turkish with English table of contents. Yeni Valde Han. Kat 5, Yeni Postane Karsisi, Istanbul, Turkey. Contains among others, the following articles: "The Activities of the Hydrobiological Research Institute" (Part II), by Recai Ermin--reports on studies of mullets (*Mugil*), bluefish (*Pomatomus saltator*), horse mackerel (*Trachurus*), shrimp, lobster, hydrography, the causes of the red tide in Izmir, and the pollution of the Golden Horn; "Tuna in Turkish Sea Waters and Its Catch" (Part I), by İlham Artuz; "Sarda sarda and its Catch" (Part II), by Sitki Üner; and "About the Technical Problems of our Fish Canning Industry" (Part III), by A. Baki Ugur.

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UNION OF SOUTH AFRICA:

Fourteenth Annual Report, Fisheries Development Corporation of South Africa Limited (Covering Period 1st October, 1957, to 30th September, 1958), 20 pp., illus., printed in English and Afrikaans. Fisheries Development Corporation of South Africa, Ltd., Sea-Fare House, 68 Orange St., Cape Town, Union of South Africa. Presents brief reports on the state of South Africa's fisheries; and research and general activities of the Corporation, including the rendering of assistance to the Department of Fisheries, Thailand.

WASHINGTON:

Report of Operations, 1958 (Fisheries Research Institute, University of Washington), 29 pp.,

illus., printed. College of Fisheries, Seattle 5, Wash., March 1959. Contains sections on the history of the Fisheries Research Institute, the fisheries of Alaska, Alaska salmon industry projects, and summary of Federal contract projects. Details are presented on red salmon studies at Nushagak and Chignik; pink salmon studies at Kodiak and in southeastern Alaska; high seas salmon tagging; salmon tagging in Cook Inlet and Prince William Sound; salmon tagging off the west coast of Prince of Wales Island; Kvichak red salmon studies; effects of logging on the productivity of pink salmon streams in Alaska; sea lion studies; stream catalog of southeastern Alaska; and king crab studies.



JAPANESE OYSTER ON UNITED STATES PACIFIC COAST

The Japanese oyster, Ostrea gigas, was originally imported to the United States Pacific Coast from Japan during the 1920's. It now supports a sizable industry in British Columbia and the state of Washington. The Japanese oyster is one of the largest in the world; it can attain a length of more than a foot, although the average length is less than this. The waters of the Northwest, while similar to its native waters, are somewhat colder. For this reason, the animal does not spawn every year, and seed (young oysters) must be imported from Japan.

--Sea Secrets, The Marine Laboratory,
University of Miami, Coral Gables, Fla.

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OUTDOOR FISH COOKERY

It's no secret that during the summer months cooking is moved outdoors. Thousands of supermarkets will promote "Cook-Out U. S. A." with special displays, recipes, posters, and pennants.

Nine American fish "Cook-Outs," filmed to reflect the heritage and tradition of the areas portrayed, are shown in a new sound-color, 16 mm. film released by the Bureau of Commercial Fisheries, U. S. Department of the Interior.



Designed to intrigue those who cook outdoors--either in the open spaces or in their own backyards--the film is the 16th in a series of fishery educational motion pictures produced by the Bureau. All are available to interested groups on a free loan basis. The "Outdoor Fish Cookery" film requires 28 minutes and has been cleared for public service television.

BARBECUED FISH STEAKS

2 pounds salmon steaks or other fish steaks, fresh or frozen	2 tablespoons hickory liquid smoke
2 tablespoons salt	1 teaspoon Worcestershire sauce
1 cup water	1 teaspoon salt
$\frac{1}{2}$ cup catsup	$\frac{1}{2}$ teaspoon grated onion
1 cup salad oil	$\frac{1}{2}$ teaspoon powdered mustard
$\frac{1}{2}$ tablespoons lemon juice	1 teaspoon paprika
2 tablespoons vinegar	1 clove garlic, finely chopped
	3 drops tabasco

Thaw frozen steaks. Cut into serving-size portions. Add salt to water. Soak fish in brine for 3 minutes. Turn and soak other side for 3 minutes. Drain. Combine remaining ingredients and blend thoroughly. Marinate fish in sauce for 30 minutes. Place fish in well-greased hinged grills. Grill over moderately hot coals for 7 to 10 minutes or until lightly browned around the edges. Baste with sauce. Turn and brush with remaining sauce. Grill for 5 minutes longer or until fish flakes easily when tested with a fork. Serves 6.

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